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HEALTH CARE OF CHILDREN UNDER FIVE

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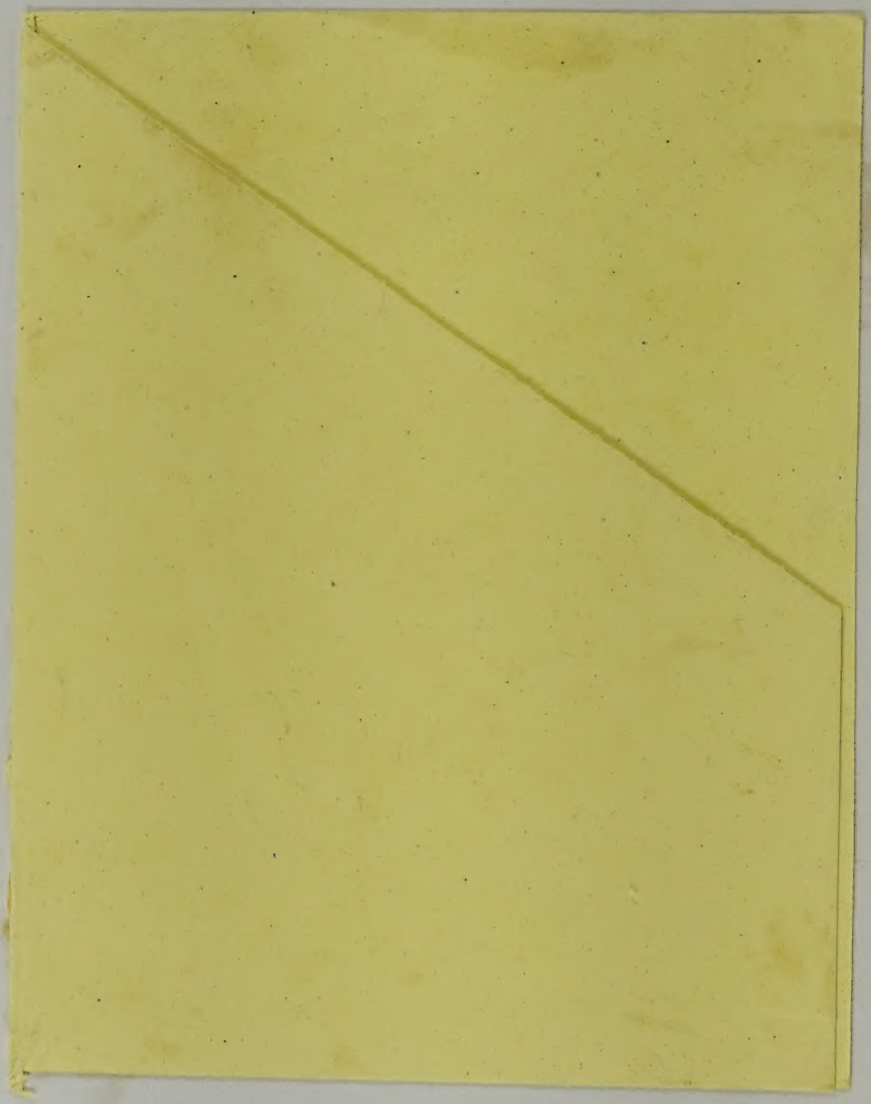

COMMUNITY HEALTH CELL

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Health Care of Children Under Five

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Workshop on
Health Care of Children Under Five
Under the auspices of the Nutrition Subcommittee
of the Indian Academy of Pediatrics, the Institute
of Child Health, Niloufer Hospital, Hyderabad and
the Voluntary Health Association of India
(formerly CAHP)

The Voluntary Health Association of India
New Delhi, 1976

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Dr Y. C. Mathur, for the Institute of Child Health, Niloufer Hospital, Hyderabad; and

Sister Anne Cummins, for the Voluntary Health Association of India New Delhi.

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(1) Dr S. K. Behera, India; (2) Dr A M. Caspallan, Philippines; (3) Dr E Gonzalez Corona, Cuba; (4) Dr M. T. El-Mougi, Egypt; (5) Dr S. Harijono, Indonesia; (6) Dr P. Khanjanasthiti, Thailand; (7) Dr M. N. Mehta, India; (8) Dr N. Miglani, India; (9) Dr H. O. Omer, Sudan; (10) Dr H. Tourinho, Brazil.

Foreword

Children between the ages of one and five constitute more than 15 per cent of our total population and they are the most vulnerable to malnutrition. The mortality rate in children below four years in our country is as high as 40 per cent, as compared to less than seven per cent in most Western countries. A recent country-wide nutrition survey carried out on a large number of pre-school children revealed that in 80 per cent of them the heights and weights were below the tenth percentile values of the pre-school children in the United States of America. It is, of course, well known that a very large proportion of our children belonging to low income groups are severely undernourished. Apart from protein-calorie malnutrition, vitamin A deficiency, which is one of the preventable causes of blindness in our country, is a major nutritional problem. Nutrition is one of the most important factors responsible for proper growth in infancy and childhood. According to some workers malnutrition during the critical phases of early growth can lead not only to the stunting of physical growth but also to suboptimal intellectual development and poor neurointegrative competence in children. Thus, malnutrition is undoubtedly the most formidable problem we are facing today.

It must be admitted that the participation of health agencies in nutrition programmes so far has been unsatisfactory. In the outpatient clinics of hospitals and the primary health centres, a large number of children with mild and moderate malnutrition are seen. Apart from the fact that there is a dearth of facilities for treating them in our hospitals and primary health centres, doctors and nurses working in these institutions are not conversant with the technique of the under-fives' clinics. In order to fill this void the Co-ordinating Agency for Health Planning, in collaboration with the Nutrition Subcommittee of the Indian Academy of Pediatrics and the Institute of Child Health,

Niloufer Hospital, Hyderabad, organized a workshop. Among those who participated in it were Dr David Morley, who had set up the first under-fives' clinic in the Wesley Guild Hospital in Western Nigeria, and some of our eminent pediatricians, including those who had gained valuable experience in the few under-fives' clinics set up in our country and other health care personnel.

The main aims of the under-fives' clinic are to supervize the health of all children up to the age of five years, prevent malnutrition, immunize the children against preventable diseases and to provide simple treatment for their common ailments. The under-fives' clinic is an ideal setting for demonstrating, in a practical way the inter-relationship between maternal and child health and family planning. In this clinic there is a team approach which aims at using all grades of health workers to the maximum of their ability and training, by responsible delegation of duties, especially to the nurses and auxiliary nurse midwives who are the first to come into contact with the community. In this way the doctor's precious time is saved so that he can devote more time to the really deserving cases and to fulfilling his role as teacher and team leader. Community involvement is also encouraged in every possible way. For example, parental responsibility is sought to be ensured through distribution of child weight charts to mothers for keeping as home-based health cards. Health education is a primary objective of the clinics and to achieve this, full use is made not only of the medical and para-medical personnel but also of every intelligent member in the community.

In fact, the essential technique of an under-five's clinic is so simple that it can be applied at a primary health centre, or a hospital of any size, including a large teaching hospital. However, it is important to note that in our country only those villagers who live within a radius of about five kilometres from a primary health centre care to utilize the facilities provided in this centre. It has, therefore, been found necessary to describe as far as possible in a separate chapter such modifications to the technique of the under-fives' clinic as may be necessary to overcome this handicap. Miss Dolores Laliberte of the Rural

Health Research Centre, Narangawal, Punjab, has been kind enough to write Chapter XI on the basis of the actual experience gained in the Research Centre.

It is our fervent hope that this booklet will help all concerned implement successfully the nutrition and health programmes for children under five and that this will have the good effect of acting as a booster to the family welfare programme, as has been spectacularly demonstrated at the under-fives' clinic at Palghar, about 90 kilometres from Bombay

P. K. DURAISWAMI
Director

Date : August 15, 1973

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1 Introductory Remarks*

I deem it a great pleasure to inaugurate the workshop on the "Care of the Under-fives" organized by the Nutrition Subcommittee of the Indian Academy of Pediatrics, the Institute of Child Health, Niloufer Hospital, and the Co-ordinating Agency for Health Planning. I thank the organizers for this opportunity and for their kind invitation extended to me.

In the majority of developed countries, services for infants and children of all age groups commonly develop along separate lines of prevention and treatment of disease. Furthermore, major emphasis is placed on the first year of the child's life, and services are geared mainly to the protection of infants. The modern trend of overspecialization and compartmentalization of child health services and pediatrics has not spared certain of the most highly developed countries of the world.

In developing countries this approach does not fit in with the realities of life. It is not acceptable to the people themselves, and it is uneconomical in terms of available facilities and personnel. World-wide experience has now taught us that in developing countries the separation of preventive and curative health services is not advisable. This is primarily due to the pattern of health and disease in developing countries, to lack of personnel and facilities, to the difficulties of making health

* Inaugural address of Dr T. Perera, MCH Adviser to World Health Organization on 6-10-72 at the Institute of Child Health, Niloufer Hospital, Hyderabad on the workshop "CARE OF THE UNDER-FIVES".

services acceptable to the population, and to such factors as great distances and insufficient transportation. Furthermore, it should not be forgotten that in these countries, few children are free from infections, infestations, or some degree of malnutrition. According to local circumstances, preventive and curative measures for the health of mothers and children will have to be blended in different and changing proportions.

The present trend is, therefore, towards a comprehensive approach that uses all possible contacts with mothers and children as opportunities for preventive, educational, and curative activities. In order to achieve this objective, the concern for and research into the health systems is increasing all over the world, and we in the World Health Organization welcome this trend.

This meeting on under-fives' clinic is an important one, and, to some extent this meeting will be one of the first of its type in breaking new ground. There are several reasons for my saying this. First of all, it is unusual in that you will only be talking about delivery of health care. You will be thinking about this at grassroot level in the primary health centre or sub-centres. The under-fives' clinic system, I believe, is a comprehensive approach and offers every child the best combination of curative, preventive, and promotive care with the resources that are made available. It is designed to be able to reach all the children in the community.

Secondly, this meeting is particularly concerned with 80 per cent of India's children who live in rural India. Only a few of them reach hospitals or clinics. I think I am correct in saying that in India child health workers are now no longer just concerned with those who come asking for help, but believe that those who do not come may need the help of the health services even more. Some important steps have been taken by the great advances made in the malaria and smallpox eradication programmes in this country, but now the need is to approach each individual child. We are concerned that the child be born into a family where the births are well spaced, a family which will be small but healthy.

Lastly, this meeting brings together diverse interests, all with a deep concern for the small children of this great country.

There are representatives of some of India's leading pediatric departments. We welcome ten international pediatricians on the UNICEF/WHO course and we look forward to their contributions to these discussions, bringing views from as far away as Brazil, Cuba, Egypt, Sudan, Thailand, Indonesia, and the Philippines. Then, there are members representing the Church Associated Hospitals, many of whom have a tradition of rural work, and to whose vision and financial support we are all indebted. We have representatives of UNICEF, WHO and other organizations who share your concern for the small children of India. Last, but not the least, we have with us Dr David Morley, who, as you all know, has done pioneering work in West Africa in this field with great suceess. I am sure his personal experience will be of great benefit during the discussions.

In conclusion, I may say that healthy children are the greatest resource of this country. I hope this meeting may take some steps forward in the struggle for healthier children, and perhaps give some lead to others among the developing nations. I take great pleasure now in inaugurating the workshop on the "Care of the Under-fives" and wish the deliberations all success.

The Symbol

This is the symbol or emblem proposed for use for under-fives' clinics in India. It is a triangular or pyramidal shaped emblem

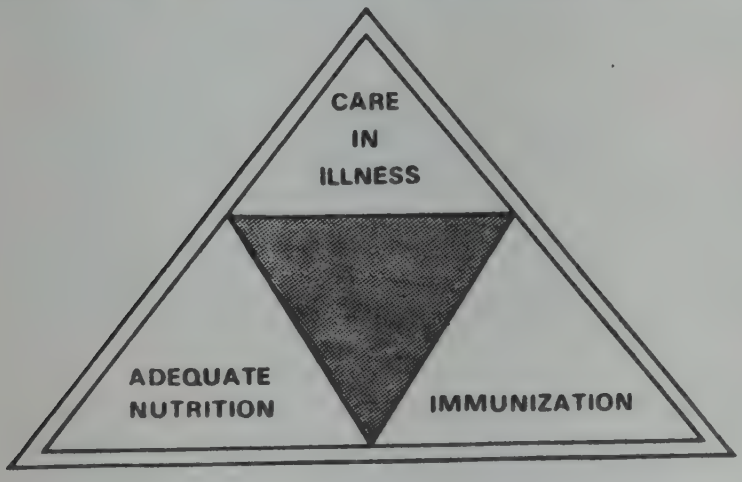


FIG. 1 : Symbol for under-fives' clinics

intended to illustrate the comprehensive nature of the clinic. At the apex is an area which can represent the "care and treatment of sick children". This is at the top because it is the first and felt-need of so many parents. They bring their children most often to clinics because they are ill, and only when the staff have listened to their problems, considered and treated the disorders, will they be receptive to advice about all the other benefits which the under-fives' clinic offers. In the bottom left hand corner of the triangle is an area which might represent "adequate nutrition for growth and development". These themes go together : nutrition, growth and development. In the bottom right hand corner of our triangle is an area which may represent "immunization and the prevention of infectious diseases". Now there remains in the centre of our symbol an inverted triangular area. If this is coloured red, we have the familiar family planning triangle of India. This puts family planning in its correct context, in the centre of concern for the health and well-being of the child. Around the whole motif is a border that touches all the other areas. This can represent "health teaching" which is necessary for each part of the service, and binds them all together.

II Why the Under-fives' Clinic?

Philosophy and Significance of Under-fives' Clinics

"The pattern in developing countries is such that an extraordinary burden of disease and death falls on small children. In these countries 35-60 per cent of all deaths occur in children under five, who make up 17 per cent of the total population."[1]

The under-fives' clinic is a practical approach to this problem.[2,3,4,5] It is not simply an out-patient department for small children; it has a more far-reaching significance.

1. It is relevant to the modern combined approach of Maternal and Child Health and Family Planning services.

2. It is widely applicable, and can be modified for a clinic in a village primary health centre or a medical college out-patient department. Sophisticated equipment and highly specialized staff are not necessary, but rather an enthusiasm to love and care for children.

3. It demonstrates that a responsible delegation of duties can produce a better and more comprehensive service.

Dissatisfaction with the delivery of health care in many countries indicates the need for a new direction. Under-fives' clinics, because they are widely applicable and are aimed at health promotion as well as therapy, are in the vanguard of this change.

Health workers are concerned that emphasis has been misplaced in the past and that prior concern should be shifted from the large hospital, which is usually a teaching institution, to the

primary health centres and their supporting district hospitals in the country. Health workers are no longer concerned only with those who come to them for help, but feel equally responsible for those who never reach clinics and hospitals, and whose need is so often very much greater.

The Objectives of the Under-fives' Clinic

These clinics attempt to offer comprehensive care for all children under the age of five. They can be built on the foundation of existing out-patient departments, but have a different emphasis. Adult out-patient clinics in developing countries were designed to separate out the more severe conditions for specific therapy, and to offer symptomatic relief for the rest. So, often clinics for children have been developed along similar lines. Because the under-fives' clinic attempts to offer curative and preventive services, the mother will receive teaching at a number of points as she passes through the clinic. Her child will receive curative and symptomatic treatment as this is the mother's "felt need". The child will also be weighed, the weight charted, and any immunizations that are due will be given. The mother is unlikely at first to understand the need for prevention, the importance of weighing children and other services designed to promote growth and health.

The under-fives' clinic should be run in association with antenatal and family planning services, all of which need to be available to the mother at the same visit. However, the needs of the children are so fundamentally different that, whenever possible, the care of the children should be separated from the care of adults, unless they are accompanying the child.

The spectrum of disease in those countries in which under-fives' clinics have been developed is similar to that commonly found in the rural areas of India. Table I shows the pattern of disease in most developing countries with the three major causes of morbidity and mortality : diarrhoea, respiratory disease, and malnutrition.

It is against this background of disease that the objectives of the under-fives' clinics are laid out. They are as follows :

1. The supervision of the health of all children up to the age of five.
2. The prevention of malnutrition, pertussis, tuberculosis, smallpox, poliomyelitis, diphtheria, tetanus, and measles.
3. The education of parents to promote health and family planning.
4. The provision of simple treatment for diarrhoea, with or without dehydration, pneumonia, skin conditions, and other common disorders.

Table I
Major Causes of Death in the Under-fives

	India Khanna Study (1957)	*Imesi, Nigeria (1957)*	*Buasula, Zambia*	*North Sumatra*	*Pusan, South Korea*
Diarrhoeal diseases	2%	12%	18%	25%	15%
Pneumonia	*	12%	10%	11%	9%
Malnutrition	41%***	12%	16%	26%	14%
Malaria	*	8%	15%	8%	3%
Whooping Cough	18%**	8%	13%	2%	4%
Measles		8%		7%	16%
Smallpox		5%			
Tuberculosis	3%	5%		6%	8%
Anaemia	*		7%	5%	7%
Neonatal	23%	*	*	*	*
Other	13%	30%	21%	10%	24%
Children	1,958		340	1,282	1,036

*included in "other"
**includes tetanus
***includes malnutrition with diarrhoea

Note : All the conditions in italics can be prevented in an under-fives' clinic. Health education and early diagnosis and treatment can reduce mortality from the others.

History of the Under-fives' Clinic

The under-fives' clinic grew out of a study in Nigeria, West Africa, in which children in the village were carefully followed from their mother's pregnancy through the first five years of

life, and beyond (5b). From the study it became clear that most of the diseases affecting these children were preventable, but that, if they were to be cared for, a simple service needed to be designed which would largely be supplied by auxiliaries. These workers come from the same area as the mothers whose children are being cared for. There were many reasons for this, but the most important was that women from a similar background could interpret health care to a community which had a traditional belief as to the cause of disease and illness. The care needs to be continued and it is particularly concerned with the supervision of growth. It is for this reason that the so-called "Road to Health" chart, which will be described in detail in Chapter V, was designed and has been now widely recognized and used in many developing countries of the world. Unlike most other records, the concern here was to make this chart always simpler, as its understanding by medical and paramedical workers from the area, and in course of time by the mother and the community itself, is so essential.

The study in this West-African village showed that successful service must involve frequent contact with the child. With the limited resources of a developing country, this means that it has to be very low in cost and not far from the homes. Lastly, the service should be reproducible, and this has proved to be the case. The clinics first started in Nigeria, spread to Sierra Leone and then became a national programme in Zambia and Malawi. In the first of these countries, already 30 per cent of all the children are receiving care through this service, and in Malawi they have the objective of being in contact with over 60 per cent of all the children in the country within a decade.

Under-fives' Clinics in India

Even though the doctor : population ratio in India is 1 : 4,300, about 70 per cent of the doctors serve only 20 per cent of India's population in the cities. The doctors who could be most involved in these clinics are those at the primary health centres, or at the Maternal and Child Health Centres of the hospitals in towns. They look after the health and medical problems of 80,000 to 100,000 population in about 100 villages under each

primary health centre, or a larger population in a town or city. Few doctors working in these situations have had experience or training in methods of management, and particularly in building up and working with a team of nurses and auxiliaries who should relieve them of many of the diagnostic and therapeutic burdens of minor illness and can be responsible for much of the health teaching. Unfortunately, the time and interest of many medical personnel, particularly those in urban areas, may be diverted by monetary gains through private practice.

The people who should help in the under-fives' clinics are the nurses in hospitals and auxiliary nurse midwives (ANMs) working in the primary health centres and their sub-centres. One ANM is assigned for a population of 10,000, to look after the health of mothers and children. But in practice she attends to only 5,000 of the population, which means that the remaining 5,000 are deprived of any medical attention even from an ANM. This is a big segment consisting of 40 per cent of India's population, involving 220 millions who reside in remote, small villages or hamlets. Unfortunately, the training of the ANM contains little instruction in the care of the infant in the first year of life, and even less in the vital years from the age of one to five. The training has, in the past, concentrated too much on assisting the mothers during child-birth, although the services that the ANM can offer to rural mothers are unlikely to greatly influence the maternal mortality and morbidity. If, however, her training was to be modified and she became a family health worker, she could well play a major part in caring for the young children of the community and with modern immunization and even limited drugs, she could well reduce the child mortality by half. This presupposes that she reduces the time she currently spends on family planning promotion. However, it is almost certain that if she was involved in the care of the children, and particularly in the spacing of births, as described later in this book, she would have a far greater impact on family planning than at present. Although the public health nurse has a more effective training in child care, there are too few of them, and even their education is not geared to the requirements of children in India.

In the past, universities the world over have been concerned, through their medical schools and teaching hospitals, with the care of the individual child, and the last fifty years have seen unbelievable advances in this field. However, only recently have universities become involved in the planning and designing of health services for the community. Recently, a few universities in India have started to undertake studies into the methods of caring for children in a block. Once this new approach has been developed, the university will automatically become involved in a study of how the auxiliary worker, through whom these services will be provided, can be better trained. Operational research into how best to prepare and use these personnel has the highest priority if we are to find new methods of providing services for children. In a few pilot situations in India, nurses and ANMs, who have had specific training, have been effectively carrying the primary health care in under-fives' clinics.

III The Organization of Under-fives' Clinics

Lines of Flow

A "line of flow" is simply a series of steps within a clinic to ensure that no important aspect of care is neglected. The happiness and good temper of those who work in the clinic, and of the mothers, will depend on the thought and careful observation given to the lines of flow. A mother with a sick child should not have to force her way through a crowded door; passageways used for staff circulation must be left clear. The following is one simple pattern that has proved successful.

The idea of lines of flow in a clinic is an important one and the subject should be frequently reviewed in the weekly meeting

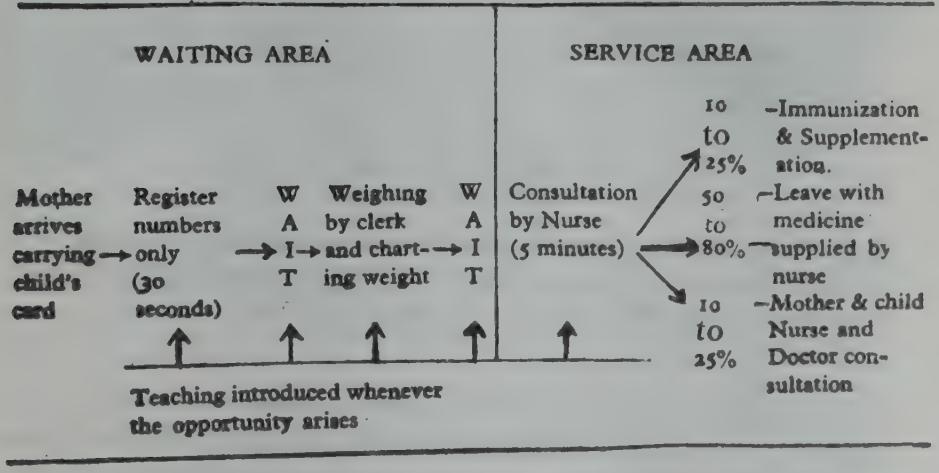

WAITING AREA
SERVICE AREA
Mother arrives carrying child's card
Register numbers only (30 seconds)
WAIT
Weighing by clerk and charting weight
WAIT
Consultation by Nurse (5 minutes)
10 to 25% -Immunization & Supplementation.
50 to 80% -Leave with medicine supplied by nurse
10 to 25% -Mother & child Nurse and Doctor consultation
Teaching introduced whenever the opportunity arises

FIG. 2 : Lines of flow in an under-fives' clinic

of the health team. Examining this line of flow, we find there is no delay in starting the clinic because the mother is carrying her own record and no attempt has to be made to find these records in the clinic. Registration is necessary, but it should be of the simplest character; probably no more information needs to be kept than whether the mother and child are new or old attendants. After registration she will carry her child's "Road to Health" chart and wait for the child to be weighed. After weighing she, will again sit in the waiting area until she is called for consultation with the nurse. In some clinics registration, weighing and charting are combined in one move. After the consultation with one of the nurses she may pass to an area for immunization, or she may leave carrying the medicines supplied by the nurse, or alternatively, she may be one of the small proportion of mothers who will go with the nurse for a further consulation with the doctor.

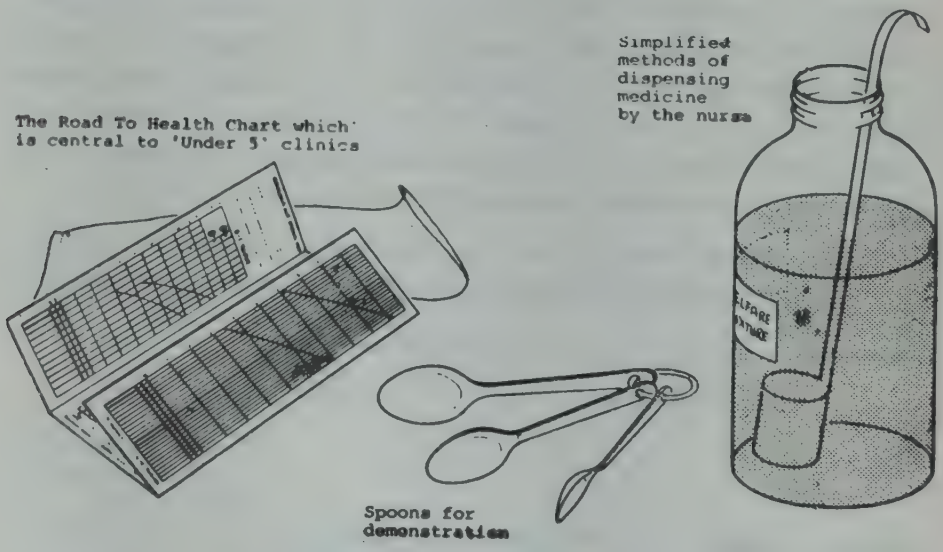

Simplified methods of dispensing medicine by the nurse
The Road To Health Chart which is central to 'Under 5' clinics
Spoons for demonstration

FIG. 3 : Tools of the clinic. Simple medicines can be put straight into mother's bottle using a scoop. Spoons are used to demonstrate the dose. The kept-at-home weight chart is central to the under-fives' clinic.

The children are seen in the order in which they arrive, but if a child is obviously desperately ill, an attempt is made to deal with him at once. No one likes to be kept waiting, and a mother, with pressing domestic responsibilities and possibly a

fretful child, is no exception. Everything possible should be done to cut down delays without limiting essential teaching. Group instruction during the inevitable waiting periods and relevant posters and pictures in the room will make the time more interesting and instructive.

The suggestions made below add to the convenience and efficiency of an under-fives' clinic, but it is emphasized that there is no need to delay setting up a clinic because of lack of suitable building or furnishings. Improvization is usually possible within existing clinics or out-patient areas. It is the concept of comprehensive child care and not the accoutrements that are of prime importance in under-fives' clinics.

Comfort of the Mother and the Child

In the waiting space and in the rooms where the mothers arrive, the seats should not be higher than 35 cm. The mother with a child on her lap is uncomfortable on a chair of standard height; if she sits with her heels off the ground her legs may become painful, and if she puts her heels down, the child may slip off her lap (fig. 4).

An easily accessible tap, or other source of water supply is essential so that she may get a drink for herself or her possibly feverish child. Not only adequate and clean latrine accommodation is essential, but a special design may be necessary which can be used without fear by the children.

One particularly valuable feature is a low wall with small gates separating the area of staff activities and circulation from the waiting place. This prevents crowding round the staff as they work, without making the mother feel too far off from where she will be seen. The registration desk will probably be in this low wall and the clerk should be seated on a high stool behind the desk, so that his eye level is the same as that of the mother. The weighing station may be near the desk. Either a beam balance scale with weights moving along an arm, or a modern spring suspension scale on which the child can be suspended in special trousers or in a chair, is most satisfactory.

If the space for the scale is situated in a "well", the child, when perched on the scale, is less likely to be frightened as he

a low seat is needed if a mother is to be comfortable with a child on her lap

FIG. 4: A low seat for the mother.

is at the same level as the working surface on either side. For older children an adult scale with a toddler bar is required. This latter scale may also be used for antenatal and adult weighing.

The system in which the mothers form a sitting queue on the benches and slowly "shuffle" their way along is only slightly more satisfactory than a standing queue. If, on arrival, the mothers deposit their children's cards and these are kept in order, they soon learn that they will be seen in correct sequence. It is better to have a "queue of cards" in a file than a queue of of mothers. The mothers should be called into the consultation area in groups of ten. While they wait to be seen, they can learn "by overhearing".

In more than one rural area doctors have reported that the level of clinic attendance was improved when specific days in

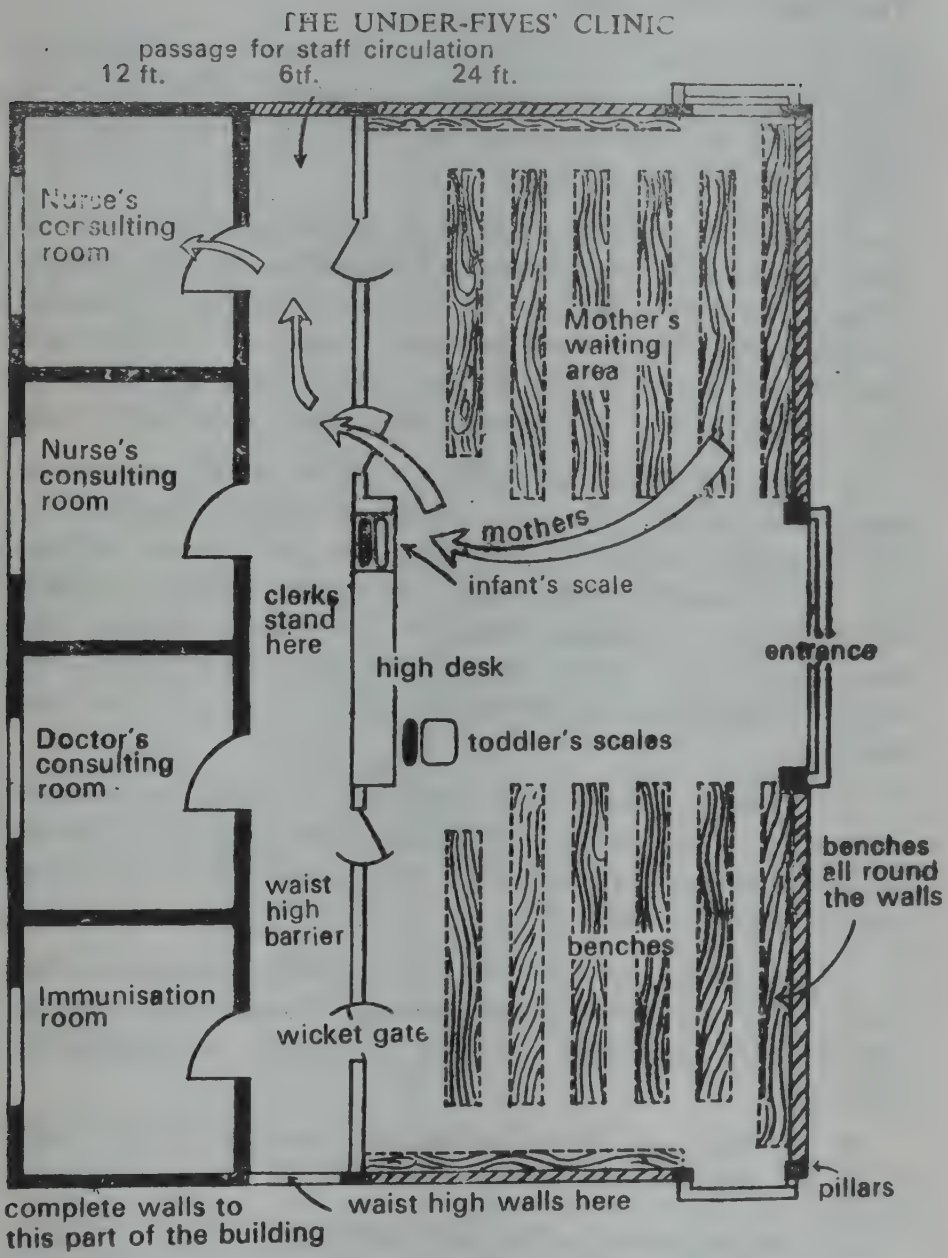


FIG. 5 : The layout of a large under-fives' clinic

the week or month were set aside for different villages or areas, and on those days as complete attendance of that village community as possible was attempted. This is similar to the system now used in some European schools where children from one village work together in an attempt to promote their sense of community.

The Comfort of the Staff

The staff of an under-fives' clinic will have to spend long and exhausting hours in the building available. The doctor in charge must be concerned with the details of the building if his staff are to function efficiently.[6]

An architect defined the purpose of a building as a structure to protect those who live or work in it from the weather and external distractions. In most hot climates this primarily implies protection from the heat of the sun. Some of the important ways by which a room may be kept cool, dry, and "friendly" are so often ignored that doctors need to be familiar with them.

1. Light means heat; therefore, windows should be small or suitably protected. However, adequate light is essential for careful examination of the children. The roof should preferably be overhung with large projecting eaves. Where possible, the length of the building should be across the direction of the prevailing winds. A knowledge of the direction of storms may suggest modifications which will keep out the worst of the wind and rain.

2. When the sun hits the roof, the air under it becomes warmed up. Depending on the type of building there should be space between the ceiling and roof, allowing for circulation and escape of hot air.

3. The outpatient clinic will contain many people generating heat. This must be permitted to escape upwards and, clearly, the height of the room and wall vents near the ceiling are important.

4. If there is any choice of building material, mud or mud brick is a better insulator than concrete block.

5. The outpatient building will be the first and most frequent contact that the local people have with medical services. Usually existing buildings will have to be used, modified, and perhaps extended. The extension will, in most cases, consist of a waiting space which could be erected by the community. A simple plan is suggested and has been designed so that the available space can be divided in different ways by partitions or benches.

Frequently, the local type of building will be more acceptable to the mother and will be far cheaper to construct. Although local methods of building are not so permanent, their repair and maintenance can be undertaken by the local workers, and this is one method of providing employment in the villages where it is so badly needed. There are many possible variations on the layout of the clinic. Fig. 6 is a plan already employed in one centre in India.

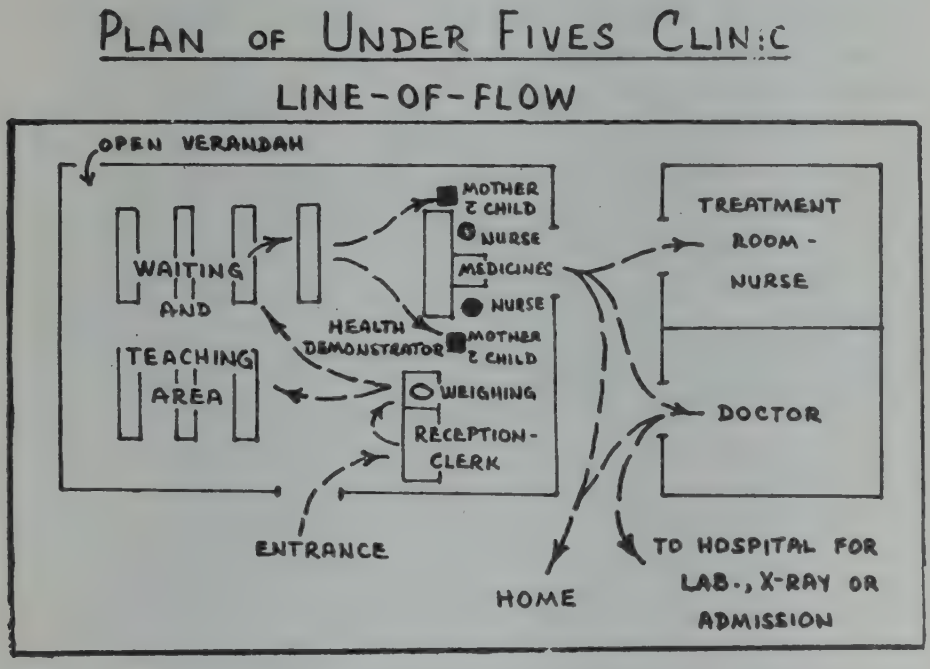


FIG. 6: Plan of a clinic which is used in India

Proximity to the Community

In India, 80 per cent of the population is rural, and half of these people live in villages and hamlets with less than 1,000 inhabitants. Operational research all over the world has demonstrated that patients are unlikely to travel more than five to eight kilometers to receive medical care, and for the toddler who needs to be carried, this distance may be reduced even further. Thus, if health care is to be brought to the people, it must be close to their homes and, as a corollary, it must be cheap and simple.

As well as setting under-fives' clinics in small villages and hamlets, they also have a place in the large hospitals of the country. If the same requirements are necessary for the children in the hamlets as in the cities, surely the resources should be similar. If the doctor and nurse have been trained to work in an under-fives' clinic in a city teaching hospital, they will be at home when later they have to undertake the far greater responsibility of caring for children away from their parent institutions.

There is an additional reason in India why attendance at clinics far from the mother's home is difficult. A high proportion of women in India from the lower socio-economic groups are economically active and play a part in earning the family income. Consequently, attendance at a clinic is an economic stress, for when the mother takes her child she may lose her day's wage. Even if she is not a wage-earner, unlike women in some countries, her activities are heavily structured and it is difficult for her to give up her household chores of fetching water, cooking, looking after her husband and other children, so that she can make regular attendance at the clinic.

IV The Team and Its Tasks

The Child, the Mother, the Health Worker, the Nurse and the Doctor

A doctor concerned for the health of children carries a broad responsibility. Whether they are children brought to him for advice, or those in a particular community, he must not only treat their illnesses, but, far more important, he must also educate the parents so as to give their off-spring every chance of a healthy and productive life. In addition to formal teaching, this involves making use of every situation for all the staff to discuss correct feeding for adequate growth, immunization, child spacing, and family planning, and how to manage common disorders in a simple and practical way. This is an enormous task, especially in a country where children make up a large proportion of the population, where they have a high mortality and morbidity, and where many parents do not have even an elementary understanding of science as applied to health. However, the doctor, as leader of the health team, can safely delegate routine aspects of the work if he takes the time to train and supervise other members, and nurses in particular.

Dr Maurice King makes this point clearly in *Health, Manpower and the Medical Auxiliary.* He writes "We demarcate too sharply the role of the registered nurse...denying her the opportunity to assist the doctor in many of his time-consuming tasks." 'It was Dr David Morley who devised and popularized the special under-fives' clinics and definitely gave the nurses both the training and the responsibility for handling this comprehensive child care service.

If the nurses are properly trained for work in an under-fives' clinic, they may be more effective than interns, safer than the village quack or injectionist, and will be more available than a pediatrician in handling the routine problems and promoting the health of young children. The effective training and responsible delegation of duties to nurses has particular relevance to India's large village population. Bryant has pointed out : "More than half of the world's population live in rural parts of developing countries. It is there that they will receive their health care, and they will receive a very large part of it from the hands of nurses. It is important that the nurses be made as ready as possible for that role."[8]

The nurses can competently manage the majority of children attending the under-fives' clinics, but with current experience they have to refer 10-30 per cent to the doctor. During the consultations in which the doctor is involved, he is making double use of his time by teaching and raising the standard of care offered by the nurse, and, incidentally, increasing the respect given by the mother to the nurse.

The nurse is not acting just as a 'filter" allowing certain patients through. The doctor is working with the nurse and guiding her in the continuing care of the children who will visit her regularly. This daily contact between the doctor and the auxiliary worker will lead to a high standard of work. The doctor is here fulfilling his roles as manager and teacher, effectively delegating and also training the auxiliaries for greater responsibilities.[9]

Report between the Nurse and the Mother

To the mothers of sick children the nurses from their own locality inevitably become the most important people they meet at the clinic. The great importance of the nurse is the critical factor in the whole psychology of the clinic, and is something that the doctor does all he can to promote. Professor Spence of Newcastle-upon-Tyne has held that consultation is the quintessence of the medical art,[10] and in the under-fives' clinic this is certainly true, except that here it is consulation not between mother and doctor, but primarily between the mother and the nurse. Professor Spence maintains that the

true purpose of consultation is to give explanation and advice, and that diagnosis is usually but a means to achieve this and must never become an end in itself. Such explanation and advice leads to the correct action by the mother in matters concerning the health of her child; this action is much more likely to follow careful and sympathetic explanation than an abrupt and ill-understood command. Because she comes from the same culture as the patient, a well-instructed and supervised nurse is the best person to explain and offer sympathetic advice to the mother.

The mother-nurse relationship is so crucial that it must be strengthened wherever possible. Thus, every time a mother comes to the clinic, if possible, she should be seen by the same nurse, and each time she consults a docter this nurse *must also be present* at the consultation. The doctor should take particular care to ensure that in all he does or says he always supports the nurse in the eyes of her patient. More of his time should be spent in discussion with her. This is why the arrows between the nurse and doctor are heavy in fig. 7. The failure

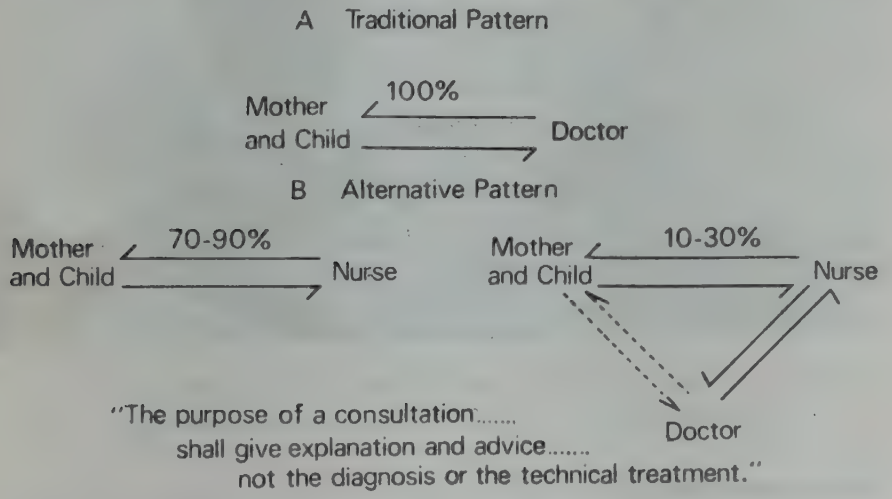


FIG. 7 : *Consultations*—all else in the practice of medicine derives from it.

in these clinics is mostly because the doctor does not have the nurse present, and fails to fulfil his obligation to teach and support her. If the child has to be admitted into hospital, a visit from the nurse when in, and then a return to her care on

discharge gives continuity and confidence. In some clinics, the child's card bears upon it the number or colour coding for the particular nurse who looks after that family. This system allows time for the nurse to provide care for the symptom that provoked the visit first and then proceed to health promotion and teaching. After a discussion about appropriate diet she will arrange for any immunizations or vitamin A supplementation which is due. She then considers the birth interval between children and can advise about spacing and family planning.

FIG. 8 : A well instructed and supervized nurse is the best person to explain and offer sympathetic advice to the mother

Training and Referral

The training of a nurse for such responsibilites in an under-fives' or a village clinic should mostly be performed in the service situation.[11] There she first observes, and later is involved in the consultations; enquiring, examining, and making decisions about the seriousness of a case and the treatment needed. As a part of their training, a certain amount of information on a

child is supplied to the group of nurses, so that they may plan out what action they would take, and bring their decision to the tutor for further discussion.

The nurse is supplied with a simple manual of *Instructions and Standing Orders* with which she should be familiar. This contains information about the aims of the service, how to conduct a consultation, an immunization schedule, and standing orders for the management of the "top ten" diseases in the area. These instructions include advice for the parents, dosages of suitable medicines, and danger signs which are indications for referring patients to the doctor. An example of such instructions is set out in Chapter X

Correct referral is an important matter, in which the nurses and ANM need specific instruction. In the standing orders for the common disorders danger signs are indicated for each condition, and these should be practically demonstrated to auxiliaries, whenever possible. Every trainee should be able to recognize a child with significant dehydration, respiratory obstruction, and impaired consciousness with a raised fontanelle tension. To know which children are seriously ill requires experience, and the failure to recognize a child who needs urgent admission may result in personal tragedy and undermine confidence in the under-fives' clinic.

Strict rules for referral may have little meaning in isolated situations in rural India where roads may be impassable and distances too great. Often medical workers have to strive to do as much as they can with limited resources.

Referral should be a two-way process. When a nurse from a sub-centre refers a child to the doctor at the primary health centre, she should send the child's health card and some details about the condition. The doctor should then refer the child back to the nurse with some explanation and instructions for continuing the treatment. This is a valuable form of in-service training.

Health Education in the Under-fives' Clinic

Health teaching is an imperative function of all members of the staff, and, given with an encouraging smile, must permeate all

activities of the clinic. Specific talks with cooking demonstration are best carried out informally in the waiting space. The mothers should feed their children with any food prepared at the demonstration. Teaching may be effective during the consultation; here not only the mother, but also eight or ten other mothers waiting to be seen are involved. These mothers are "learning by over-hearing". The teaching is built on the mother's existing knowledge. No one should be permitted to lecture to the mothers. A discussion with several mothers, in which they unfold the course of natural history of the common disease of childhood, will be popular. The role of the teacher must be to guide this discussion and particularly to offer advice on the management of the condition at home, and to emphasize those symptoms that suggest the need for a visit to the under-fives' clinic.

The doctor, in consultation with his staff, must decide what should be taught and the following rota has been found useful in one hospital in India.[4]

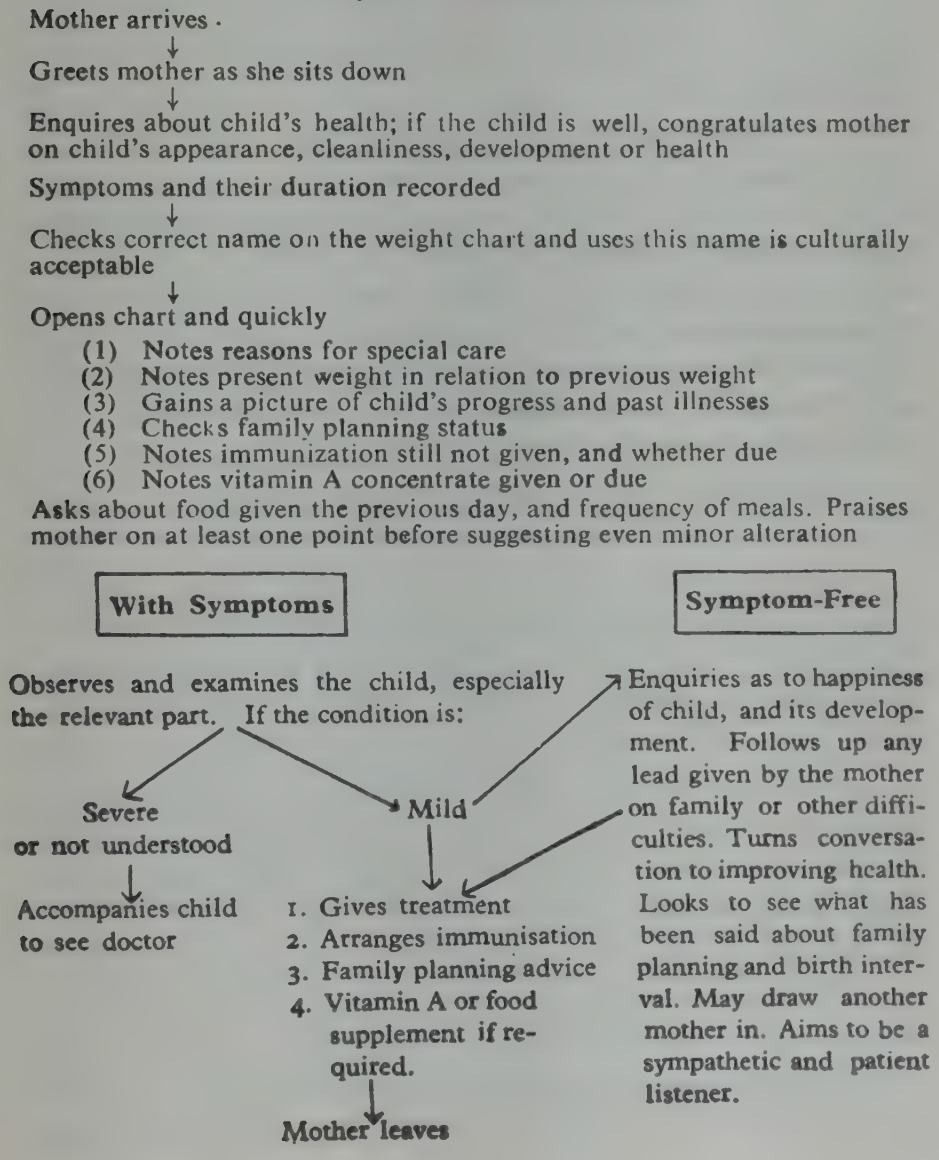
Table 2
Under-fives' Clinic Teaching Rota

Monday	Child health and weight cards, the importance and use of the cards
Tuesday	(a) Immunization (b) Scabies and skin sepsis } Alternate weeks
Wednesday	(a) Diarrhoea (b) Sore eyes } Prevention and home management } According to season
Thursday	Feeding infants and children
Friday	(a) Family planning and child health (b) Intestinal parasites and hygiene } Alternate weeks
Saturday	Prevention of Protein-Calorie Malnutrition
	When Teaching Remember
1. Be brief	— 5 to 10 minutes is enough in a busy clinic
2. Be simple	— make one or two points clearly, don't confuse with too much information.
3. Visual aids	— use visual aids and actual foods when possible
4. Be heard	— speak really loudly and capture the interest of the mother
5. Be remembered	— where possible emphasize your teaching with one of the well known proverbs
6. Call the doctor just before you begin	— he is interested to hear and support your teaching.

Deployment of Staff and Part-time Workers

The greatest economy can be achieved in employing staff to the utmost of their skill and ability. It is clearly wasteful to employ a nurse for weighing children when a clerk can be trained to do this accurately in a week or so, or a doctor to see the common conditions when these may be quite adequately taken care of by a nurse specifically instructed in their diagnosis and management, who is also trained to teach and promote health.

FIG. 9 : Steps in the Nurse's Consultation


Mother arrives
Greets mother as she sits down
Enquires about child's health; if the child is well, congratulates mother on child's appearance, cleanliness, development or health
Symptoms and their duration recorded
Checks correct name on the weight chart and uses this name is culturally acceptable
Opens chart and quickly
(1) Notes reasons for special care
(2) Notes present weight in relation to previous weight
(3) Gains a picture of child's progress and past illnesses
(4) Checks family planning status
(5) Notes immunization still not given, and whether due
(6) Notes vitamin A concentrate given or due
Asks about food given the previous day, and frequency of meals. Praises mother on at least one point before suggesting even minor alteration
With Symptoms
Symptom-Free
Observes and examines the child, especially the relevant part. If the condition is:
Severe or not understood
Accompanies child to see doctor
Mild
1. Gives treatment
2. Arranges immunisation
3. Family planning advice
4. Vitamin A or food supplement if required.
Mother leaves
Enquiries as to happiness of child, and its development. Follows up any lead given by the mother on family or other difficulties. Turns conversation to improving health. Looks to see what has been said about family planning and birth interval. May draw another mother in. Aims to be a sympathetic and patient listener.

Those responsible for the organization of the under-fives' clinics in any situation need to work out a consultation plan for the nurse, to be carefully followed by the nurse as she sees the child. A possible step-by-step method is set out in fig. 9 and is designed to be as simple as possible.

This is the first step in a job description.

There is a place for part-time workers in under-fives' clinics, and in the section about operational models, an account is given of how they can be utilized (p. 28). The use of volunteers in these clinics is also mentioned in the section about community involvement (p. 67).

A weekly staff meeting is an important part of the work of a health team. It is an opportunity for discussing any problem which has occurred, a chance to teach, a time when results and evaluations can be shared, and is most worthwhile if all members can be encouraged to voice their suggestions and opinions. Particular emphasis needs to be placed on the role of the junior staff, many of whom, particularly when away from work, can play an important part in simple health education in the wider community.

At the meeting, discussion should take place on points such as :

1. Reducing the waiting time for mothers. The "flow-diagram" is valuable in seeing how mothers pass through the out-patients and in discovering how the contacts the mother makes with different members of the staff, even if it has to be short, can be made more effective.

2. Ensuring that urgent treatment is given to the seriously ill child. All staff, including the sweepers, are encouraged to identify such children. Whoever brings such a child to the doctor for emergency treatment should be congratulated on their part in saving the life of a child.

3. Uncovering points of friction between members of the staff, and bringing these out for discussion.

4. Educating all members of the staff on matters such as nutrition and the natural history of common diseases, and

discovering ways in which every activity can have an educational content. When off duty and away from the hospital all members of the staff, from the sweeper upwards, will be asked for advice on medical problems, and for this reason even the most junior ones should receive this type of education.

Operational Models of Under-fives' Clinic Technique

Work Load and Cost

1. *Rural Hospital in Andhra*

At a medium-sized hospital in rural Andhra, during a six-week period in 1971, 1,962 children were seen at the under-fives' clinic, or a daily average of 55. Of these, 550 (28 per cent) were seen by the doctor, 414 (21 per cent) were shown because the nurse was anxious about the child's condition, and 136 (7 per cent) by special request of the parents. This means that over 70 per cent were handled by the two nurses in the clinic. In some clinics, where the proportion of seriously ill children and the demands of the parent are less, the nurses alone handle up to 90 per cent of all the children themselves. This is professionally satisfying for the nurses and gives the doctor time to employ his skills in the examination of the more seriously ill, and in teaching and supervising the other members of the health team.

The clinic described above is open from 8-30 A. M. to midday, six days a week. It is staffed by a doctor who gives about a quarter of his working time to this service; three nurses devote nearly half of their working time to the clinic, two in consultation and one giving injections, doing dressing, etc. An auxiliary health demonstrator devotes a third of her time to the clinic and a full time clerk spends afternoons in preparing new cards and filing the old. This results in a monthly salary bill of Rs 890, and, if divided by the average monthly attendance, it means a cost of 63 paise for each child seen. If it was possible to get patients to come steadily over the three to four hour period when the clinic runs each morning, the same staff could handle significantly larger numbers without detracting from the quality of service.

The average cost of medicines, not including vaccines which were supplied free by the government, was Rs 1.35 per child, and equipment and stationery, Rs 0.13. Thus, the total cost for each child seen is Rs 1.18. This is a lot for most villagers, but is much less than the cost in many clinics providing only curative care.

2. *Nutrition Rehabilitation Clinic, Maharashtra*

In rural Maharashtra, a Nutrition Rehabilitation Programme has included the under-fives' clinic technique as part of the service. Here part-time middle-aged women, who have education up to 7th Standard, organizing ability and enthusiasm, were selected. They were given orientation along with ANMs and later practical training in the field for a total of 17 days in taking weights, recording on weight charts, and giving health and nutrition teaching to the mothers. They were then responsible for serial weighing and recording, periodic deworming, nutrition education, and health promotion. They assist an ANM to hold four clinics a week at which the average load is 25 children.

Costing of Under-fives' Clinic

Very little detailed research into the expense of delivery of health care has yet been undertaken. Currently, studies of under-fives' clinics in many countries and their costing are being attempted. At the present time, figures from many countries suggest that a true costing shows that each visit of a child will be a some-what over one rupee. This is far too high, but yet, it is not expensive, considering the package of health care which is delivered by these clinics, compared with the standard of care given by most hospitals and practitioners. There are many possible ways of reducing the cost and this will clearly be essential if these clinics are to be widely available in India.

Job Description of Doctors and Nurses in Under-fives' Clinics

In India the hospital outpatient clinic is the first contact with scientific medical services for the majority of patients. The doctor needs to devise a system to that the first of his three roles does not become dominant.

The roles of the doctor, as

1. *Clinician*, giving detailed care to 10-30 per cent of the children attending. This will include the more complex conditions and the more seriously ill children.
2. *Teacher*, continually giving further training and support to the nurses and auxiliaries with different qualifications who will care for the vast majority of those attending the under-fives' clinics.

   This pattern of care is brought out in fig. 7. (The quotations are taken from Spence's writing).
3. *Manager*, supervising, guiding, and coordinating the other members of the team to maintain the most effective service possible. He should be alert for bottle-necks in the "line-of-flow", lead but not dominate the staff meetings. He will also be responsible for evaluation.

The role of the nurse is to promote the health of all the young children attending the clinic by :

1. Treating the minor illness
2. Referring the more seriously ill children
3. Instructing about feeding, nutrition, and hygiene
4. Immunizing to prevent disease
5. Encouraging child spacing and family planning (it should be noted that teaching is involved in every one of these activities.
6. Maintaining the children's weight cards
7. Being alert for any way in which the effectiveness of the service can be improved.

More detailed instructions about the nurse's functions are given in Chapter X.

Problems and Overcoming Them

These can be briefly divided into problems with personnel, problems with the community, and problems with equipment and supplies.

Personnel

If the staff have the correct orientation and adequate training, many of the difficulties which may be encountered can be overcome, especially problems involving the contacts with the community. Unfortunately, most doctors, nurses, and ANMs have a disease-based rather than a health-based training.

Moreover, the medical profession has been brought up with the idea that it alone is responsible for diagnosis, and few doctors on qualification have any understanding of the essentials of delegation and management of the team of health workers in a primary health centre, nor have they any experience in the second essential skill they will require, namely, teaching juniors and passing on skills to the workers of their team. These are likely to be the greatest difficulties in introducing under-fives' clinics on a large scale in any state in India. For this reason, a period of in-service training of a doctor together with his team of auxiliary workers may be essential if under-fives' clinics are to spread quickly.

The doctor has a further difficulty in that so little operational research has been done concerning his work, and he is already asked to do several days' work within the period of a single working day, if he fulfils all the functions required of him. However, the appeal of the care of small children is a very positive one. Many doctors will become inspired with the possibilities of moving out of apparently endless curative treatment, into the positive field of promoting health through leading and working closely with a team and local people in improving the health of their own children.

Even when the urgent demands of the seriously ill take up a disproportionate amount of time and energy, it is often possible to utilize the illness as an opening for health teaching. To keep health promotion in the forefront of the team activity will be a continuing struggle. If emphasis is continuously laid on preventing illness by immunization, the advantages of this over curative care will slowly be accepted.

Fitting in the joint consultation so as to minimize any waste to time for mother, nurse, and doctor can be a real problem of

logistics. However, unless this is worked out, the confidence and training of the nurses, on whom the whole clinic depends, will be undermined.

Since the doctor is both team-leader and teacher, his orientation is fundamental. It is essential that he demonstrates his respect for every member of the team, and uses their training and ability to the full. The pressure of demands for curative care, and the financial rewards of therapeutics should be countered by sound community health training and possibly by special scales of pay.

The use the weight chart appears to be simple; however, when used at "grass roots" level, certain difficulties arise as many of the workers using these charts will not have gone through the experience of learning about graphs during the period of their education. The educationalist, Jean Piaget, has shown that such symbolism is probably best taught in the age-group nine to twelve, and, if not learnt in this period, it may be more difficult to appreciate later. However, experience has shown that once health workers have mastered the importance of the child's progress in parallel relation to the lines on the weight chart, they comprehend the essential value of this record in following up the children. The educational process required for the introduction of these charts must not be underestimated and there may be a period of six months to a year before the staff really understand and appreciate their use.

Community

Most communities in India are not conscious of the need for actively promoting health. They appreciate the benefits of scientific medicine for illness, and generally are willing to pay for it. Some groups are beginning to realize the advantages of immunization, but very few see the need to monitor growth and promote health, and are unwilling to contribute financially for this. Consequently, "Well baby clinics" are unlikely to touch a significant proportion of the Indian population until education about health is much more advanced. On the other hand, under-fives' clinics that set out to answer the felt need of treatment in illness as well as promoting health, attract mothers once

it is known that they will receive effective treatment for the minor illnesses of childhood : diarrhoea, respiratory tract infections, skin and scalp sepsis. In one under-five's clinic in India, these three complaints accounted for 55 percent of the attendance.[12] Once the mothers come, they can be involved in discussion, the most efficient method of health teaching, and the children can be reviewed, given immunizations, and vitamin A concentrate as indicated. Thus, though children are at first brought with various disorders, as the mothers return periodically, they will begin to learn of the value of preventing disease and actively promoting growth and health.

Relevant and imaginative ways of reaching public opinion must be developed. The cinema, the most popular entertainment medium in India, needs to be utilized more effectively. Calendars are popular, and health calendars that would compete in attractiveness with those produced for commercial advertising could reach many homes.

Some people are more "doctor conscious" than others and the parents may insist on seeing the doctor for even trivial disorders. Often these people are better educated and therefore ultimately more amenable to teaching about the true aims of an under-fives' clinic. Moreover, if they see the nurse first, and then the doctor endorses her suggestions about management at the joint consulation, the mothers will come to appreciate that the suggestions of the nurse are sound, and confidence will be built up.

Equipment and Supplies

With regard to equipment and supplies the two most fundamental needs for any clinic are weight charts with strong plastic bags and a weighing scale. Weight or "Road to Health" cards are becoming more readily available (see address, at the end of Chapter V) and it is hoped that they will soon be produced in every state in one of the acceptable patterns. In November 1972, a conference on weight charts was called by the World Health Organization. The chart suggested for international use is similar to those shown in Chapters V and VIII.

The ideal weighing scale has yet to be designed, but the most suitable ones available at present are the modern hanging spring

FIG. 10: A reliable Salter hanging scale with circular dial weighing up to 20 kg is suitable for all pre-school children. It is available from any Salter agent at reasonable price.

balances used with a small chair or several "pairs of pants" in which the young children are suspended (fig. 10). These are generally accurate to 100 gm and should be checked periodically against sand-bags of standard weight.

Immunological vaccines are a high priority for any clinic, and considerable time may need to be devoted to convincing the area health authorities that generous and regular allocations of vaccines to under-fives' clinics is a very worthwhile way of using the available supplies. Problems of storage, shelf-life, etc. are considered in Chapter VII. Medicines are also important, since the majority of the children attending come with significant illness. A cheap and effective armamentarium is more important than elaborate or elegantly packaged items. A suggested list of medications is included in Chapter X. In each clinic it will be necessary to decide how these medicines are obtained and paid for. A regular supply is essential to the prestige and effectiveness of the clinic.

V The Weight Card or "Road to Health" Chart for Under-fives

The under-fives' weight card, or "Road to Health" chart is the key to the whole clinic. It is the first and best of a series of patient-retained, or parent-retained health records. All the aspects of comprehensive care for children can be incorporated on the single card in an attempt to bring the following points under surveillance and control.

1. Disease and suffering
2. Nutrition and growth
3. Anaemia
4. Xerophthalmia
5. Infectious disease
6. Fertility
7. Severely malnourished children

A doctor working single-handed rarely succeeds in dealing with more than one or two of these matters, but a health team with the child's card before them can review these points systematically and give a very high standard of care.

The World Health Organization has recommended "The use of simple standardized forms for recording graphically the weights of individual infants and pre-school children..."[13] The weight card described is in line with these recommendations and has the purpose of encouraging parents to promote an adequate rate of growth and, incidentally, achieve fuller intellectual development.

Main Features of the Weight Card

Throughout the world, increasing numbers of weight cards are being used. The following are the main features :

1. Calendar to record the child's age.
2. Graphic representation of a child's clinical and nutritional history.
3. "Road to Health" curve constructed from accepted growth standards.
4. Nutritional advice with local emphasis and illustrations
5. Immunizations
6. Family planning attitude and action of parents
7. Reasons for special care
8. Parent retention of the card.

1. *The use of a calendar to record the child's age*

The child's age is recorded using a calendar which starts with the month of birth and is followed by all the months for the first five years (fig. 11).

The month of birth for each year is emphasized by a distinctive box. Having ascertained the month of birth, this is written into the first box for each year. Using this method, workers with limited education can accurately and quickly record the weight curve without calculating the age of the child at each visit.

In many poorly educated communities, it will be necessary to calculate a child's date of birth by using a local-events calendar. Village people remember events in relation to seasons, festivals, phases of the moon, and incidents in their family or neighbourhood. Using such local knowledge it is often possible to estimate a child's age quite accurately.

2. *The chart is a graphic representation of the child's clinical and nutritional history.*

Against the weight curve the doctor or nurse enters illness or other points relevant to the child's health. Because the growth curve can be seen in relation to a child's age and illness, an experienced worker can absorb the important facts within seconds. When many patients have to be seen, this is a great advantage

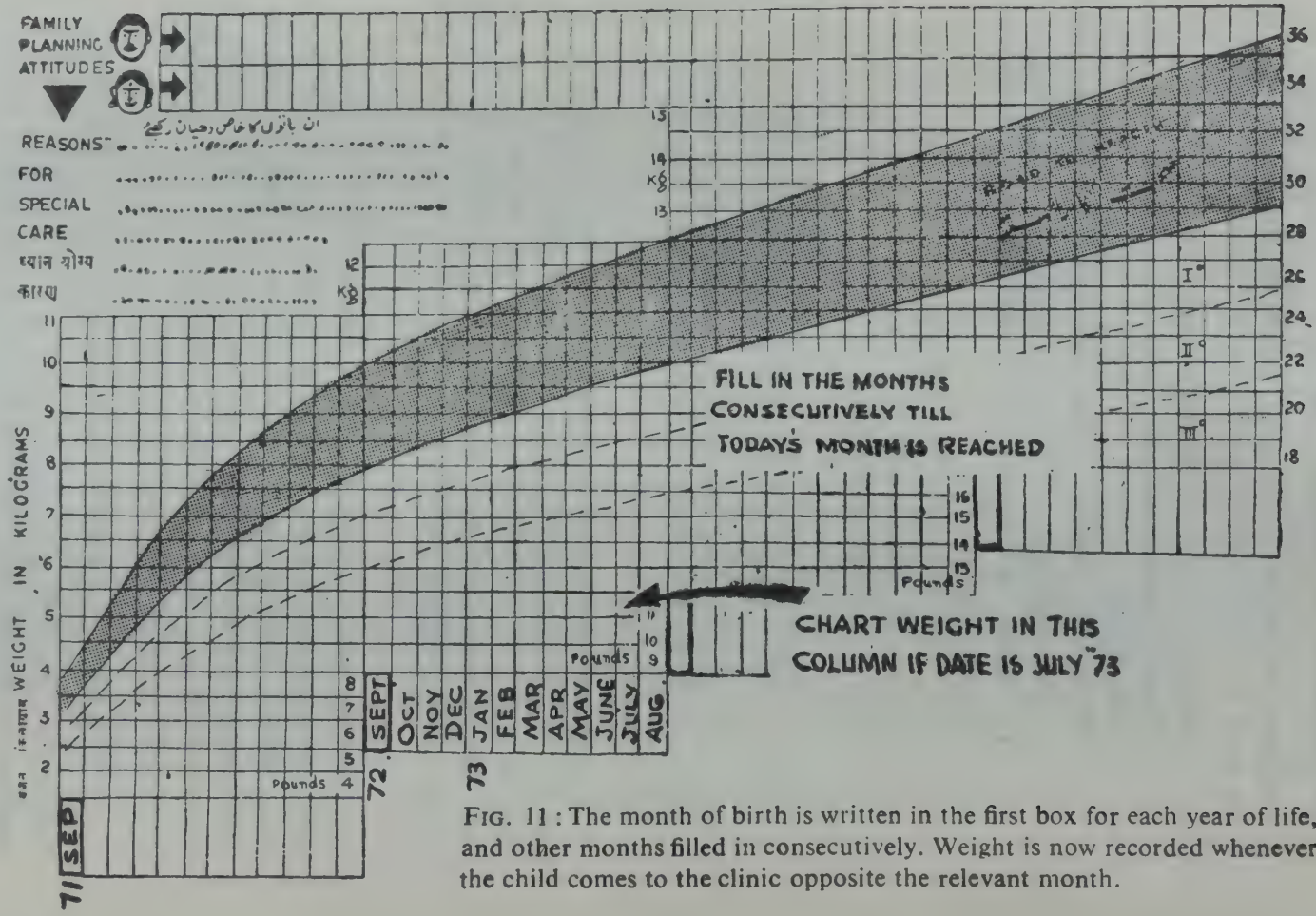


FIG. 11 : The month of birth is written in the first box for each year of life, and other months filled in consecutively. Weight is now recorded whenever the child comes to the clinic opposite the relevant month.

over a big folder of notes containing details and weights at numerous and irregular dates.

3 *The use of weight standards to construct a "Road to Health'*

Two curved lines are drawn on these cards. They represent accepted standards of growth and their direction is more important than their precise position of the chart.

When caring for children from a village situation this channel formed by the two lines can be referred to as the "Road to Health". Mothers are encouraged in the simplest terms to feed and look after their children so that they will grow up the "Road to Health". If over several months the child's curve is flat or moving away from the "Road", there is need for concern and action. In a more sophisticated and urban environment the child's weight may lie near or above the upper line, and counselling should be suited to the parents' comprehension. A steady upward progress of the weight record is more important than its position in relation to the two lines.

4. *Nutritional guidance with a local emphasis and illustrations*

On some cards the space below the graph is occupied by pictures of foods and advice encouraging breast feeding and the introduction of weaning foods (fig. 12).

A translation of the dietary advice on the card illustrated is :

a. Mother's milk is the best food for your infant.
b. After six months of age, milk is still important, but other foods must be added—see the pictures.
c. If the mother has insufficient milk, or if the child is not healthy and gaining well seek the advice of a nurse or doctor.

The pictures, though less than ideal, are understood by most village mothers and serve as visual aids to remind them of the teaching about child feeding. Similar illustrations should be worked out for the most suitable weaning foods in each area. The pictures illustrated on this card, and in a suitable sequence for introduction are :

i. Breast feeding
ii. A glass and feeding cup to illustrate *ganji* or gruel
iii. Banana

iv. Eggs
v. Rice with *dhal* and green leaf curry
vi. Cattle milk
vii. Groundnuts
viii. Beans
ix. Fish
x. Meat

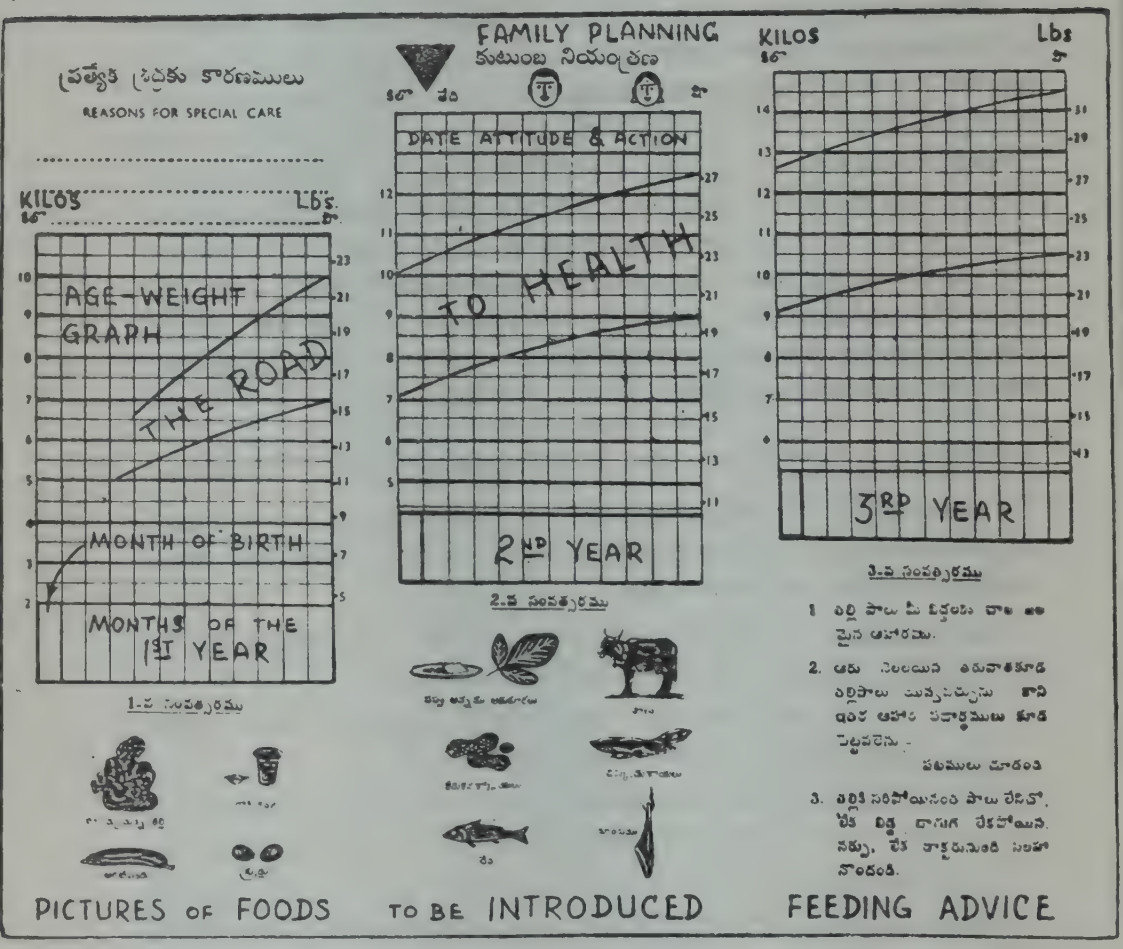


FIG. 12 : Early introduction of first foods in sufficient quantity can prevent malnutrition and keep child's weight on the road to health.

5. *Immunization*

On the back of the card is a panel listing the different immunizations (fig. 13). The boxes should be filled in as the child completes the various primary courses and booster doses. This subject is dis cussed in detail in Chapter VII.

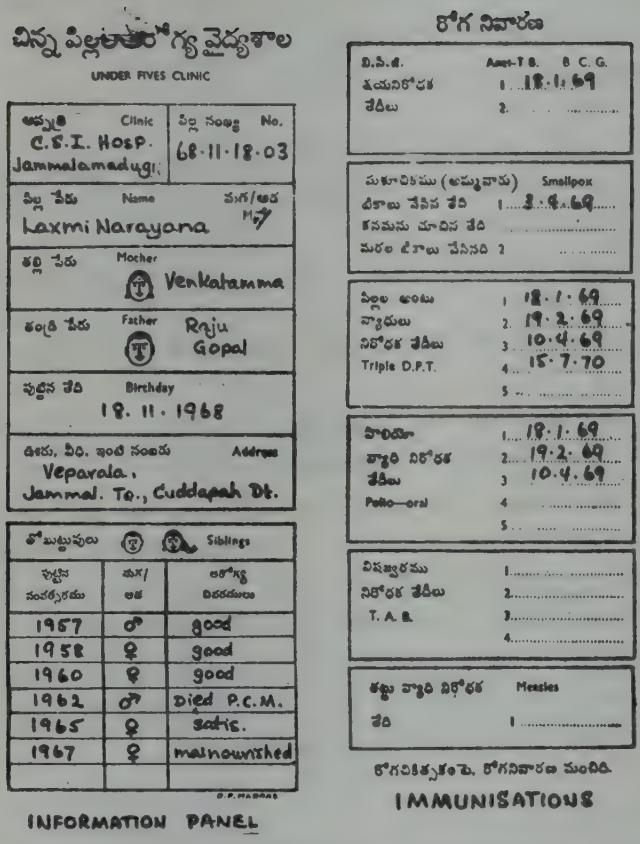


FIG. 13: For completing the child's immunization, this card can be shown at any under-fives' clinic anywhere.

6. *Family planning attitude and action of parents*

It is now recognized that a short birth interval and a high birth order are related to increased mortality and morbidity in pre-school children. Consequently, special spaces have been provided on the cards to record the attitude and action of the child's parents to child spacing and family planning. This will be dealt with in more detail in Chapter VIII.

7. *Reasons for special care*

It is recognized that certain factors predispose to disease. Children with significant family history or prenatal problems are known to be "at risk", and should be brought under close and more frequent medical supervision.[14] This "at risk" concept can be applied to those liable to malnutrition, the major

problem facing pre-school children in India. The following vulnerable groups are acknowledged :

a. Low birth weight, less than 2 kg.
b. Twins.
c. Failure to gain adequately in the first six months of life (less than 500 gm a month in the first, and less than 250 gm a month in the second trimester of life).
d. Artificially fed babies from a poor socio-economic background.
e. Measles, pertussis, or recurrent diarrhoea in the first two years.
f. Death of one partner, or a marriage broken for any reason.
g. High birth order, sixth or subsequent child.

The significant factors should be worked out for each locality. These points should be written in the appropriate prominent place on the card so that the clinic staff can always be on the alert to give the additional care that these children need.

Other "reasons for special care" include "precious children" of a relatively infertile couple, or the child of parents who have undergone a permanent sterilization operation.

8. *Parent retention of the card*

The chart, colourful and printed on strong card, is about 25 cm by 10 cm when folded, so is not very easily lost. A heavy quality, open-ended polythene cover is essential for its protection. These features increase durability, and parents are encouraged to consider the card as a valuable piece of their own property which is important to the health of the child.

Parental retention of the card is important because it is essential to secure parental participation in promoting the health of children. In this respect a card in English alone is of limited value, and one in each major language is needed. Many headings are retained in English so that health workers, who cannot read the local language, can easily understand the essential points.

The weight-age graph in the inside of the card is continuous and not broken up into separate yearly units. Special space is provided to note the parent's attitude and action with regard to family planning over the years.

Another card now available in India is shown in fig. 14. (see insert card). This child health record allows grading of malnutrition as recommended by the Indian Academy of Pediatrics[15]. (The top edge of the "road to health" represents Harvard standard, and lower lines are 80 per cent, 70 per cent and 60 per cent of this top line.) Foods illustrated are different for North and South. This card takes the child up to the age six when school health services should take over. This record is published in English and all Indian languages by the Voluntary Health Association of India, New Delhi, along with other types of patient-retained health records. It is printed on stiff coloured card 26 cm by 30 cm and given to the mother in a strong plastic envelope.

The Meaning of the Curves

What the curves on the chart should represent is still not finally decided. It is generally suggested that if the upper curve represents that of the well-nourished group in the population, the lower curve can represent the average of the village child. Various charts have been produced, including the Gomez system of classification which represents percentages of a Harvard mean. However, there may be difficulties where these charts are used, as health workers can become more concerned with what part of the chart the child's weight is in, rather than with the direction of movement of his growth curve, which is a far more important feature. For this reason, many workers prefer a line which gives direction only rather than one which suggests whether a child should be above or below it.

However, there are times when it may be useful to classify a child's weight into a Gomez-type of nutritional classification by weight for age. This system has been adopted by the Nutrition sub-committee of the Indian Academy of Pediatrics.[15] Dr P. M. Shah has designed a strong plastic folder on which are traced the curves already on the chart, as well as the additional curves for classifying malnutrition. The weight chart can then be slipped inside this plastic folder and the child's position relative to nutritional classification can be immediately read. Plastic folders cost about Rs 2.00 and part-time workers can use them successfully.

The Benefit of the Parent-retained Record

There are many benefits from a home-based health record system. These include economy of filing time and space, mobility, promoting parent responsibility for health, facilitating any home health service and generally raising the standards of comprehensive care.

Parent-retained cards are a continuous record

Few hospitals in developing countries keep adequate record filing systems for their outpatients. Maintaining a file of more than five thousand records, where the identification of people by name is not clear-cut, can be difficult and expensive both in personnel and waiting time for the children. Experience from many countries emphasizes that the mother will look after her child's own records once she has learned of their importance. These parent-retained records, unlike those given in some hospitals, do not resemble a "bus ticket," designed to take the child through one disease incident only, but give a continuous record of his health progress over five years. Such records are widely used in many areas where there is a planned service and are like to replace other types of hospital outpatient records in many countries in the next decade.

Patient-retained records arc seldom lost

Illiterate people, who have little paper in the house, seem to value these cards more than the educated patients who are often the ones who forget to bring their cards. Patients find that they get seen and treated faster when they have the health card in their hands than when without it, and to them it is a "talisman" or passport to the health services. Even if patient-retained records are occasionally left behind, they are very seldom lost permanently. A quick check of most medical records department files will reveal that even within months, a significant number of records are permanently lost.

When used in conjunction with hospital-retained record system, the patient-retained card can act as the identification card for the hospital number system.

Patient-retained records are economical

These health cards, with their plastic envelopes, cost only 20-30 paise each. A hospital record on a 17.5 cm by 12.5 cm card with accompanying cross reference file, and number identification cards will cost just as much, while quarto size folder for out-patients, used in some hospitals will cost several rupees, thus "pricing out" the poor patient.

Patient-retained records save time

Because of their simple lay-out, experienced, though not necessarily highly qualified, staff can pick out essential health data from a card in a few moments. This is a distinct advantage over a bulky file of data or no information at all. The nutritional progress, the need for immunizations and any reasons for special care can be seen at a glance. Both efficiency and speed are essential if routine health care is to be given to large numbers of patients. Unless a comprehensive health document is used either fewer patients must be seen carefully, or large numbers are "processed" for treatment or immunization only.

Parent-retained card facilitate accurate diagnosis

When children for whom no weight cards have been made are seen, most malnutrition will pass undetected. In India, marasmus, which has no special clues to alert the doctor, is so much more common than Kwashiorkor with its clinical signs. Without an accurate diagnosis of malnutrition it is difficult to treat other illnessses completely successfully.

Patient-retained records are as mobile as people

Wyon[16] found that in Punjab villages, 80 per cent of first-borns were born outside the husband's family home. For second deliveries, 36 per cent and for third, 24 per cent of mothers migrated, often with their young children, to the maternal grandmother's home. For people in government service, transfers are not infrequent. To insure that the health card is carried, the patients and staff must be taught to value them, and relatives should be warned that in the event of rushing a patient to hospital, they must remember to bring the card also, since the information can be important for any treatment.

Weight cards are valuable for home-based health care

The health card forms a natural talking point and personalized health teaching aid wherever the ANMs make a home visit. The child's name, already on the card, makes introduction easy when the nurse calls. The home-based records avoid one important difficulty in home visiting. If a health worker carries the records from the clinic into the house, the mother will be suspicious that it contains information that she does not wish to be known. To overcome this, the health workers sometimes attempt to memorize what is on the cards before entering the house, but this is unlikely to be very satisfactory. However, if the records are in the home, on the health worker's arrival, the mother can pass over the record to her who graciously thanks her, examines the record, finds something on which to compliment and encourage the mother. When the discussion is over, what is more natural than to hand the card back to the mother's safe keeping ?

Unnecessary records

Those responsible for health care planning need to take a close look at non-essential and unnecessary record keeping. Unfortunately, health authorities still demand detailed returns despite limited facilities In many countries the phrase "medical records" brings to mind "visions of inky-fingered clerks covering, in an infinitely laboured hand, page after page of a dog-eared ledger; of out-patient forms so grubby, porous and, ephemeral that they almost melt in the hand."[17]

Basic information about the number attending a clinic, also the overall nutritional state of the community and the immunizations given can be quickly collected on to tabulated forms from parent retained weight cards.

Other uses of the weight chart

Brief reference can be made with regard to other ways for which the "Road to Health" chart can be used to assist medical workers. If there is much anaemia in the area and children are having their haemoglobins taken, the 10 kg line on the weight chart can be outlined in red and considered to be 10 gm of

haemoglobin. Then whenever the haemoglobin is tested, it can be plotted on the weight chart. This will give an ongoing assessment of the anaemia of the child.

Another way in which the chart can be used is in estimating the drug dosage, using it as a ready reckoner. If a dark line is drawn across at, say, 5 kg, and another at, say, 10 kg, then the requisite dosage of certain drugs can be written in this space, and the medical worker will not have to calculate the dosage at all, he will see in which space the weight lies and merely give the dosage written in this space. A series of such marked charts for common drugs can be clipped together and kept at the consulation table.

The weight chart can be used to record the month of administration of vitamin A concentrate in the national anti-xerophthalmia programme. A large "A" placed at the bottom of the column for the month in which the supplement is given makes it very easy to see when the next six-monthly dose is due. The record is readily available with the child so that the possibility of administering an overdosage is minimized.

Lastly, the weight chart can be used for teaching about child development. Using either a card or flannelgraph of the weight chart, a picture of a child representing an important milestone, for example, sitting without support, is placed on the month of age when most children achieve this skill. Then a line is drawn from the month of the 3rd to the 97th percentile for this milestone, and this gives a clear visual lesson about the normal scatter of developmental progress.

WEIGHT CARDS

In fifteen languages—can be obtained from the Voluntary Health Association of India, C-14, Community Centre, Safdarjung Development Area, New Delhi-110 016.

Weight Card Flannelgraph with captions and pictures about growth, foods, immunization, family planning, and diseases is available (price Rs 20) from the Audio-Visual Department, C.M.C. Hospital, Vellore 1, N. Arcot District, Tamil Nadu.

VI Nutrition and the Under-fives

Growth, Nutrition and Cerebral Development

Growth is a fundamental feature of healthy children. We live in a country where full growth is an exceptional privilege. Dr C. Gopalan of the National Institute of Nutrition reports that 80 per cent of pre-school children in rural India suffer from nutritional dwarfism.[13] Other surveys in India confirm this, and one from rural Andhra found 82 per cent of the under-fives had some degree of malnutrition and 24 per cent were third degree.[19] Cravioto has emphasized that the importance of poor growth in the critical first year is that it bears a significant association to permanent impairment of intellectual development.[20] This serious malnutrition is all around us, yet it is not immediately obvious.

Repeated weighing at intervals is the most useful measure of growth in pre-school children. "It is generally accepted that a slowing in the physical growth rate provides the earliest and perhaps the most sensitive indication of impending malnutrition.[21]" Recording growth facilitates an accurate diagnosis of subnutrition and enables action to be taken at a stage when gross malnutrition can be forestalled by timely teaching and additional feeding.

Promote Growth to Prevent Malnutrition

Weight charts are the basis for nutrition promotion. At every visit the weight of each child must be compared with previous weight, that is, the angle of the child's growth curve must be compared with that of the "Road to Health" lines. Senior

workers should constantly emphasize the importance of a steady improvement in the child's weight, until everyone of the staff is concerned when the weight of a child remains the same over a period. This is particularly important in the first year of life when failure to gain, even over one month, is considered a serious indication of trouble unless there is an episode of illness to explain the static weight.

Long before a child suffering from malnutrition is brought to a clinic, he will stop gaining weight. Consequently, if the aim of all members of the under-fives' clinic staff is to promote an adequate rate of growth, this is the most positive and effective way to prevent malnutrition.

The main ways of improving the nutrition of children are .

1. Nutrition education.
2. Nutrition supplementation.
3. Nutrition rehabilitation.

Nutrition Education

Nutrition education in the under-fives' clinic starts naturally from the nurse's review of the weight curve. If the child is doing well she congratulates the mother on how well she is feeding the child, and having enquired about what is being given can perhaps suggest additional items which would be economical and which the baby would enjoy and benefit from. If the child's progress is poor, considerable time and effort needs to be devoted to enquiring about the diet and impressing on the mother the importance of larger, more frequent, and varied meals. Naturally, advice has to be geared to the economic situation of the family concerned with due regard to the beliefs, customs, and attitudes of the community to child feeding.

Some weight cards carry feeding instructions and illustrations of items of diet that can be conveniently introduced. This is described in Chapter V, with pictures of one type of card that has been successfully in India for several years. The mothers are told to show the others at home the little pictures, and this will naturally form a talking point and focus of interest around the child's diet. It is a good idea to place a tick next to the picture of a food which has been particularly stressed at a visit,

and then enquire next time about how successful the mother has been in getting her child to take the item. A knowledge of local beliefs about what foods are suitable for weaning, what should be avoided in association with certain disorders, is quite invaluable when counselling a mother. Indeed, it is unlikely that she will be convinced about nutritional advice if these important beliefs are ignored or not known.

The following notes about feeding the under-fives can serve as an outline for instructions to the clinic staff in any area of India.

1. Feeding advice should be simple, practical, and related to the parents' social and economic state. It will also vary from region to region according to food availability and feeding customs.

2. Mother's milk is the best food for a baby, so it may be continued so long as the mother is healthy, taking a good diet, and is not pregnant. Animal milk should be avoided unless needed before 4 months. Only if the mother does not have enough, she should give some other milk : buffalo, cow, goat or powdered milk. Ask the advice of the nurse or doctor about feeding details.

3. After four months of age (three months if artificially fed), milk alone is not enough. Add some other foods, e.g., simple gruel (*gangee*, *conjee*) with milk and jaggery, then *iddly*, mashed vegetables, potato, carrot, ripe banana, tomato juice, egg yolk, soft rice with ghee, curd or *dal*, soups of vegetables, particularly green leafy vegetables, and so on. Avoid too much hot spice (*karam*) and coarse textures. Try firmly and frequently, but do not force the weaning foods.

4. When mother's milk is not available, and cannot be induced, an alternative must be provided. If the family possesses cattle, this is the ideal source. Buffalo milk is widely available but is very rich in fat. Slow boiling and skimming off the fat makes it more digestable. With cow's milk in particular, the energy (calorie) content should be made up by adding a teaspoonful of sugar to every cupful, i.e., 120-180 ml (4-6 ounces). In India there is often a dangerous overdilution of milk. Though some dilution may be accepted during the first three months of

life, many now believe that it is better to let the child adjust to the milk, rather than trying to modify the milk to suit the child.

If powdered milk is available and the parents can afford it, they should be taught to make it up to the correct concentration, usually one level measure for every 30 ml of water. It is important to explain the necessity for scrupulous cleanliness. Some feel that the difficulties of keeping a bottle and teat clean in a village home are so great that the use of a traditional feeding cup or a cup and spoon technique are safer and worth the extra effort required.

5. Under-feeding is a constant danger. Some parents simply cannot afford to buy any milk. If they have no relative or friend who is lactating and willing to be a "wet nurse", they need to be taught to provide a gruel of the local staple, increasingly fortified with pulses or grams. This should be given in adequate amounts and sufficiently frequently. Repeated surveillance, reassurance, and help will be necessary.

6. Taking into account local beliefs about dietary restrictions during illness, parents should be advised against excessive limitation in amount and variety of food, especially after measles.

Nutrition Supplementation

Nutrition supplementation means adding something extra to the diet a child is already receiving, with the aim of overcoming a particular deficiency. There are several arguments against supplementation, particularly when it is isolated from nutrition education or introduces nutrients foreign to the culture of the families that most need them. However, there are also numerous snacks which are used in many communities, and other commodities that are available and acceptable and need to be encouraged as supplements. Moreover, for growing children there are social and environmental factors that sometimes so limit the availability of natural nutrients that supplementation is justifiable. Vitamin A concentrate for the under-fives, and iron for children and women in the child-bearing age are examples of valuable medicinal supplements. Food for the destitute and in emergency situations is also a form of supplement that can be justified.

Many of the nutrition supplements provided at clinics are pre-cooked foods, milk or nutrients in a powdered form in a polythene bag. All these have good nutritional values but do not provide any nutrition education to the mother. These supplements tend to have "medicinal" or "tonic" value in the eyes of mothers. This detracts from one aim of supplementation, which is to introduce a food which the mothers will later continue to feed. On a follow-up of children who had Kwashiorkor and were managed in the hospital, it was observed that 66.7 per cent of the mothers attribute the recuperation from Kwashiorkor to "medicines". Many reverted to the previous home diet on discharge, and this led to a high recurrence rate of malnutrition.[22]

Nutrition supplements provided at clinics sometimes substitute for the home feeds. In some programmes supplements may be wasted if all the children, including those with good nutritional status, or even in early infancy, when mother's milk is abundant, are provided with the nutrients! Moreover, only those who can afford the time, or know how to take advantage of the clinics, may attend. Thus, the most needy do not benefit.

There are particular dangers in the distribution of any form of milk or milk powder. In some countries where skimmed milk has been widely used there has been a serious decline in breast feeding and an increase in the use of artificial milks. These milks are often given as a dilute and septic solution which provokes diarrhoea and leads to marasmus. The provision of milk supplements must be considered with particular caution.

Recent evidence indicates that the main dietary shortage for Indian children is calories rather than proteins.[23] Thus if proteins, which are always relatively more expensive, are supplied, they will largely be "burnt" to provide the necessary calories for metabolism, and this is obviously wasteful. Undue emphasis on proteins is probably misplaced; what is generally required is more food of the type already consumed by the family.

"Hyderabad mix" is a food supplement that was developed by the National Institute of Nutrition, Hyderabad.[24] It is a mixture of wheat, groundnut, and Bengal gram, roasted and then

mixed with sugar and milk powder. (Table 3). This is simple, can be made up by the clinic staff, and has been shown to be quite effective on an out-patient basis[25]. The mothers of malnourised children are supplied with a packet a day for a week. The cost of "Hyderabad mix," for all consituents, labour, plastic bag, and pamphlet is Rs 2.15 for a week's supply of seven packets each of 70 gm. The daily packet provides 10 gm of proteins and 265 calories. Some mothers even started making their own "Hyderabad mix" at home once they had learnt the composition. but clearly it is much more important that they start feeding their children with larger amounts of the basic ingredients.

In the Punjab there is a well-known snack, called *panjeeri*, which is generally acknowledged to be highly nutritious. In one programme the "Hyderabad mix" is being distributed to children under five with a weight for age of less than 70 per cent of the Harvard mean, and it is being promoted, and readily accepted, as "Hospital panjeeri"

Table 3
Composition of "Hyderabad Mix" Packet

Wheat	35 gm
Groundnuts	6 gm
Bengal gram	11.5 gm
Skim milk powder	6 gm
Sugar	11.5 gm
Total	70 gm

Nutrition Rehabilitation

This is a technique in which feeding and education are combined by getting the mother to cook an adequate diet of local foods under supervision, and feed her malnourished child back to health. Though this is really beyond the scope of this booklet, under-fives' clinics have been used as part of the supporting services for a pilot domicilary rehabilitation programme in Maharashtra.[26] Here nutrition supplements are provided for a week at a time, in the form of cheap, locally available foods, like pulses, groundnuts, fish, and sesame. Mothers receive some supervision and teaching in their homes and supplementation continues until the child has gained weight from "severe" to

COMMUNITY HEALTH CELL

"mild" malnutrition. Follow-up of a small group of children who had Kwashiorkor revealed that 84 per cent of the mothers attributed recuperation to the diet. Moreover, the diet of other young children in the same families, and also that of neighbours, improved.

Anaemia

Anaemia is a major nutritional disorder of children under-five. In a survey of 970 consecutive children attending clinics in the Punjab, half had a haemoglobin of less than 10 G per 100 ml The WHO definition for anaemia in this age group is less than 11 G per cent). Many areas in India must have an even higher proportion of anaemic children.

Even in a well organized clinic using an M.R.C. grey-wedge photometer or a three-minute Sahli apparatus it costs much less to treat all children with iron and folic acid for six weeks than to test all and treat some when anaemia is common. Though this may be sound economic policy, it does not absolve the clinic staff from examining the mucous membranes of children to detect the most severe cases, nor from instructing mothers about feeding their children with diets which contain more iron and folate.

Xerophthalmia

Vitamin A deficiency is the commonest cause of blindness in childhood in India. A national prophylactic programme designed to provide every child under five with a massive, 2,00,000 I.U. oral dose of vitamin A concentrate every six months has been initiated.[27] The under-fives' clinics are well suited to administer this valuable supplement, and, as indicated in Chapter V, the parent-retained weight cards are ideal for recording the dates of administration and reminding staff about when the next dose is due.

VII Infectious Diseases and Immunization

Infectious Diseases and the Under-fives' Clinic

The majority of infectious diseases of childhood will be seen at the under-fives' clinic. A simple record of these is needed and except for smallpox and rabies, the child's name and address will not be required. A tally system may be used for these, and using the form shown fig. 15 will also give the age incidence of children presenting at the clinic with these disorders. From

NOTIFICATION OF DISEASE

From Aug. 12, 1973 To Aug. 18, 1973

Write the age in month (e.g. 7/12) till 3 years, then in years.

'A' for Adult

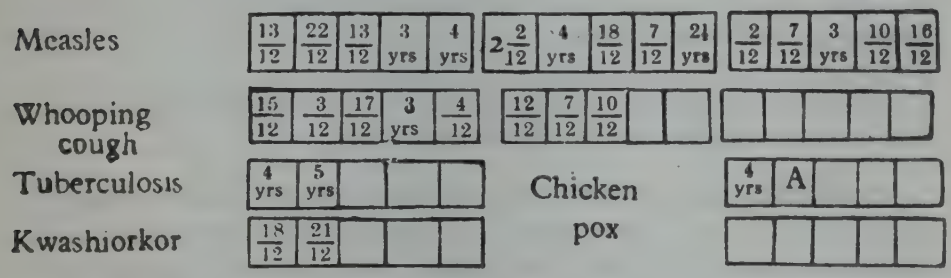


FIG. 15: Part of Disease Notification Tally form

this information a breakdown of the age incidence of infectious and other diseases seen at the clinics in each area week by week can be made. This is necessary information if the planning of an immunization programme is to be efficient and effective.

The Importance of Immunization

Immunization is one of the most valuable ways in which we can help the under-fives. Preventible infectious diseases are very common and contribute to the morbidity and mortality of so many small children and they also seriously aggravate malnutrition which is so prevalent in this age-group in India. Immunization is one of the reasons for which parents bring their children to the under-fives' clinic. Immunizations are, therefore, both important and popular.

Immunization Schedules

Schedules for immunizations have to be modified according to the circumstances of different countries in the world. This involves not only the relative incidence of the diseases, but the economics and availability of the immunologicals. For example, a programme which is suitable in Europe may be quite unsuitable in India.

A possible schedule, designed to encourage a return to the clinic at approximately monthly intervals, is shown in the appendix. As an increasing number of parents are aware of the importance of immunization, this is a way of getting them to come back regularly so that the children may receive the other benefits of the under-fives' clinic.

Comments on Immunization

1. Immunization is very worthwhile. You probably save one child's life for every ten you immunize fully.

2. Immunization is quite popular, and when a mother brings her child for this remember that she will get the benefit of regular weight and growth assessment, and the other benefits of the under-fives' clinic.

3. Start early. Whooping cough is very dangerous in the first year of life, and especially in the first six months. Polio can also attack early.

4. Regular repeated doses are important for good immunity.

(a) With DPL three early doses give the best immunity and encourage the mother to bring her baby monthly for weight check and advice.

(b) Polio vaccine may require five doses in the first year to give adequate immunity in India. There is evidence that oral polio vaccine is less effective in India than in temperate countries. Consequently, an initial course of five monthly doses has been recommended.[28,29] Though not proven, the inferior immunity may be due to antibodies and other agents in breast milk, and ideally other fluids only should be given during the three hours before and after oral polio vaccine.

5. The value of TAB below five years is debated. It is included here, because the intradermal innoculation is cheap, causes little reaction, and may bring the child back to the clinic at a stage when the mother should be advised about introducing foods. Some authorities believe that typhoid is as common in the under-fives as in older age groups, but it presents in a different way.[30]

By giving anti-typhoid or TAB vaccine in the seventh and eighth months, it may be possible to attract parents to the clinic during the third trimester of the children's lives, a time when it is important to emphasize the introduction of a mixed diet.

6. Measles immunization should be given in the ninth month. Unfortunately this invaluable vaccine is not yet available in India, though this infection is particularly virulent because of the widespread beliefs and associated with the disease, and the consequent starvation diet which the children receive.

7. Interrupted Schedule. Continue immunizations where the course was left off. It is not necessary to start again.

8. If the children who have been immunized with DPT are injured, give tetanus toxoid (Tet/Vac/PTAP), *not anti-tetanus serum (ATS) which can do harm.*

Transport and Storage of Vaccines

Little is known about the consequences of the inevitable problems of transport and storage of vaccines in India. This is a

field in which there is a need for operational research and planning. At the present time, probably a significant proportion of vaccines used in developing countries may not be active because at some stage they have become warmed up either in storage or in transport. The present tendency to use electrical refrigerators may prove unsatisfactory if there are either breakdowns or cuts in electricity, as so much vaccine will be wasted. For this reason, older paraffin refrigerators have much to recommend them. Whatever system of refrigeration is used, someone should be trained in maintenance of the refrigerator, a regular service programme must be carried out and recorded, and essential spare parts must be made available.

The transport of vaccines is difficult in a hot climate, and when going to more distant village clinics, the vaccine must be kept cold, particularly the live vaccines such as Oral Polio and BCG. When measles vaccine becomes available, its care and storage will be even more important.

Probably the most simple way of tranporting vaccine is in a wooden or cardbaord box that has been generously lined with polyester. These can be made quite cheaply if all the polyester saved from packing is used for this purpose. Such boxes are light and if a tin of liquid refrigerant (a "cold dog") is frozen overnight in the cold compartment of a refrigerator and placed in the bottom of the polyester lined box it will keep the vaccine cold at least twenty hours. Large vacuum flasks are expensive and fragile, but may be necessary for sensitive, thermolabile live vaccines like polio.

Intradermal Jet Injectors and Concentrated Vaccines

Intradermal jet injectors are instruments about the size of a large pen-torch (fig. 16). They eject small volumes of vaccine into the skin in a fine jet under high pressure. There is a reservoir to hold the vaccine, the mechanism is set by cocking a strong spring with a lever on the side of the gun, and is released by a trigger button on the top. An important advantage is that the reservoir, plunger, and election end of the unit need only be sterilized once a day for an almost unlimited number of innoculations. They are precision instruments which cost about

Rs 500 and need careful maintenance. However, this is simple and can be learnt quickly by any competent technician. There is no doubt that they are covenient, and save time and money.

Dick showed that tetanus toxoid and DPT vaccines, given intradermally, require one-fith the dose for the same antigenic response as the usual intramuscular dose.[31] Stanfield showed satisfactory antigenic effect from standard strength of DPT given by intradermal jet injector, the "Panjet".[32]

The cost of the vaccine has been reduced to about one third.

Each intradermal jet injector should be checked weekly.

Any injector failing to fire 0.1 ml per shot or firing more than 10 shots per ml should be sent for repair. A patent for an India made 'Dermijet' has been applied for by S. Mohinder Pal Singh, Pili Kothi, Sant Nagar, Karnal, Haryana. He also repairs all types of jet injectors. The "Dermijet" fires 0.1 ml intradermally, and costs less than the "Panjet." It will have 100 per cent indigenous components.

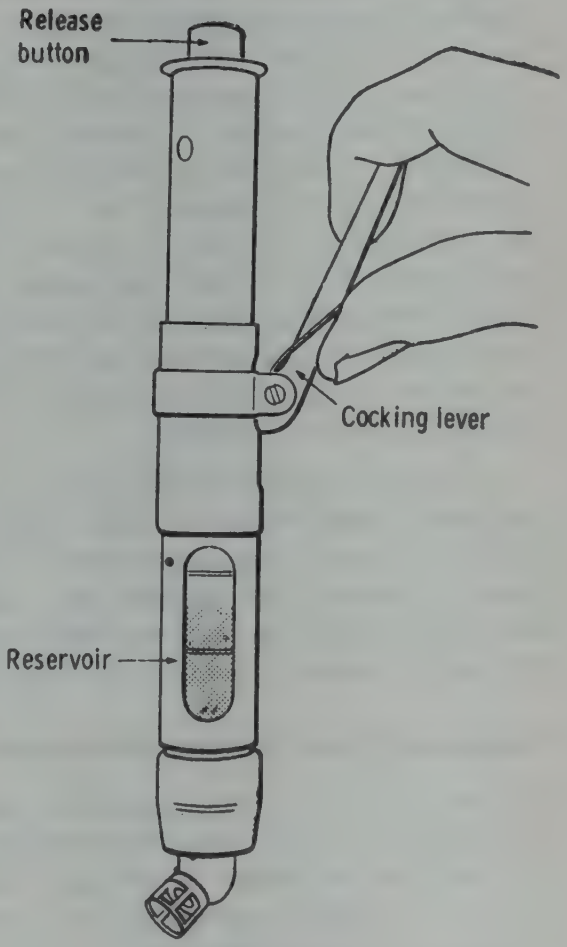


FIG. 16: The Panjet (UK) or Dermijet (India) intradermal jet injectors

Concentrated vaccines have been specially made by the **Central Research Institute, Kasauli, Himachal Pradesh.** Tetanus

toxoid, diphtheria, pertussis, tetanus vaccine, and S. Typhi acetone dried vaccine have all been concentrated so that 0.1 ml of vaccine gives a correct dose into the dermis. For bacterial vaccines, half the number of bacteria, and for toxoids, one third the Lf dose, will be sufficient intradermally. This saving in vaccine quantities will more than offset the cost of concentrating the vaccine, so that for less than a rupee's worth of intradermal vaccines, five major diseases of childhood can be prevented.

BCG is effective by "Panjet," but the vaccine should be diluted with proportionately less saline if the injector fires less then 0.1 ml. per shot. The frequency of ulceration of the nodule is much less with intradermal jet.[33] Smallpox vaccine can also be given by intradermal jet injector, but the bifurcated needle is preferable. In a large antenatal clinic in rural Andhra, tetanus toxoid is given routinely by "Panjet", saving much time and equipment. If one intradermal jet injector is kept for each vaccine, then syringes and needles will be hardly needed. In the absence of intradermal jet injectors, intradermal injections with insulin syringes can be given with good results. Trials of intradermal tetanus toxoid and DPT are in progress at Ferozepur and Ludhiana in Punjab.

It should be noted that jet injectors make house-to-house immunization and clinic or class room immunization speedier, safer, and cheaper than ever before. The time saved should be used to educate the parents more thoroughly. A different coloured pamphlet for each vaccine given in the clinic can often be read by someone in the family even if the mother is illiterate.

Immunization as a Teaching Opportunity

Immunization is often a neglected opportunity for teaching. Here, as elsewhere, the mother should be involved and the nurse will build on her present knowledge of the disease being discussed. An enlarged picture of a child with smallpox, or a nurse who can give a good imitation of a child with whooping cough, may start a real dialogue about the benefits of prevention over treatment.

It must be the experience of nearly every health worker in India to have been asked by the parents of a child, "Does my

child need an injection?" In an under-fives' clinic we can happily accept this suggestion and reply, "You are right, your child needs an injection, indeed he needs a series of injections. These will give him the strength against many serious and dangerous diseases; bring him regularly every month, and we will see that he gets the injections he needs." It has been said that for every ten children who are fully immunized in a country like India, one life is saved. This is an encouraging goal to set before the staff working in an under-fives' clinic.

VIII Family Welfare Planning

Family Planning, Child Health, and the Under-fives' Clinic

In India, family planning is not only a national concern and obligation, but it should be the personal responsibility of everyone caring for the health and welfare of small children. There is increasing evidence that a large family results in more malnutrition,[34] less cash available for each member,[35] more diarrhoea among the children,[36] and also there is a higher ipfant mortality with greater parity of the mother[37]. There are also indications that a short birth interval is associated with greater malnutrition in older siblings, for it is well known that Kwashiorkor is a word which indicates that the malnourished child has been displaced from his mother's breast and concern by a younger sibling.

The under-fives' clinic is the ideal place to counsel parents about family planning, and the "Road to Health" card is an excellent instrument to remind and assist the health team in this responsibility. The mother returns to the clinic repeatedly during her years of maximum fertility so that the staff have the opportunity of reinforcing any advice many times. Moreover, the advice is given in the context of concern for the health and well-being of the child and is therefore more acceptable to parents. The weight card carries details about the number and health of children, the intervals at which they have been born, and the response to earlier discussions about spacing or limiting the number of pregnancies.

The Birth Interval and Maternal Care

A large family is a *fait accompli*, (an existing and complete fact), but a short birth interval may be prevented from recurring.

The mother who has used family planning methods to separate the births of her children is unlikely to have an over-large family. The doctor and the nurse, when they are in contact with the mother and caring for her young baby, will come to realize that delaying the next conception and extending the birth interval are quite as important a part of health care as seeing that the latest child is adequately immunized.

Unfortunately, little information is available about details of birth intervals in India. There are certainly considerable varia-

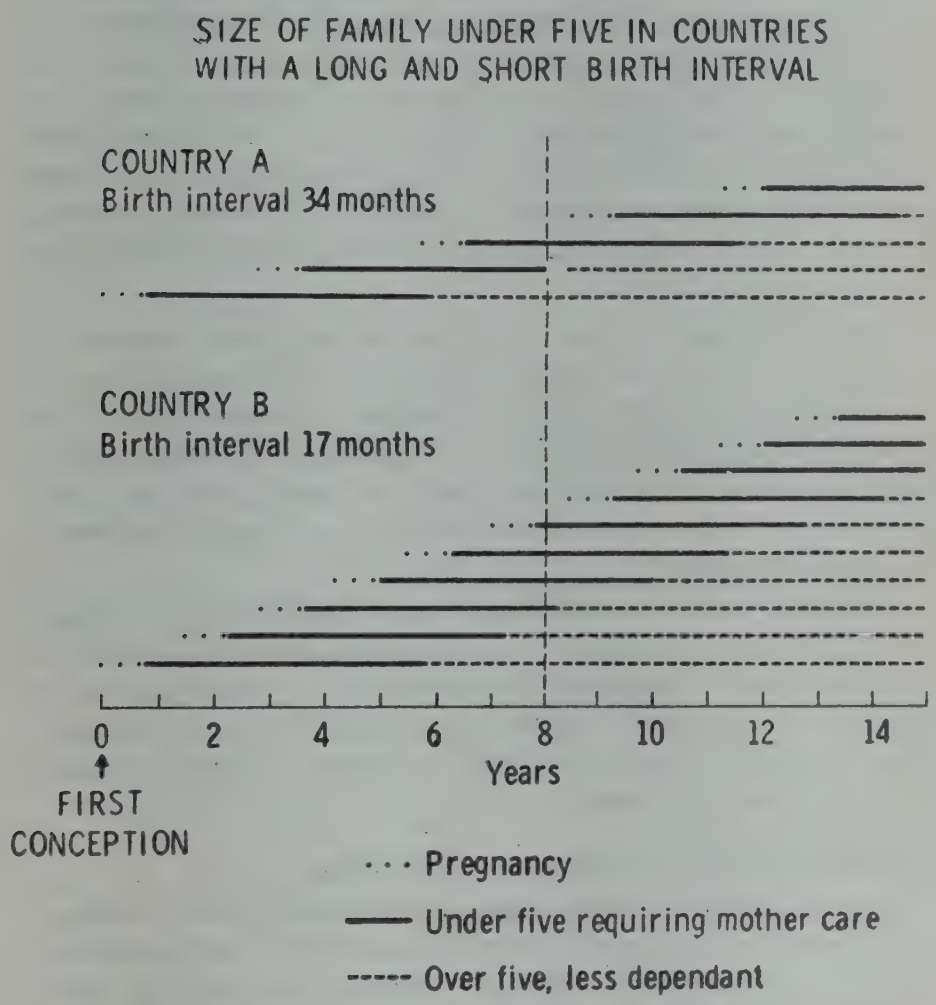


FIG. 17 : Comparison of how families build up when there is a long and short birth interval. The mother has more time for "mother care" when the interval is long.

tions between different communities and at the various stages of a woman's reproductive life. Consequently, it is difficult to lay down rules, but it may be stated that the important topic must be studied more carefully.

The relationship between birth interval and maternal care is shown in fig. 17 and it suggests why increasing the spacing is so important to the health of children.

The actual situation in two countries, A and B, is depicted in two parts of the diagram. In A the average birth intervals is 34 months, and in B it is only 17 months. The horizontal lines represent individual children, and the continuous parts of the line indicate children who are under five years of age and therefore, particularly need maternal care. At any moment in time, represented by the vertical dotted line, the mother from country A will only have one or two children under five to care for. The mother from country B has a very different situation to contend with, she will probably have four children under five to cope with and feed.

Thus, the mother from country A has both fewer children to look after, and a much longer period in which to give them her close attention, 34 instead of 17 months. Consequently, it is possible that in country A with the longer birth interval the average child receives almost four times as much love and care from his mother, as well as the nutrition and help that every small child needs.

In India, there is a fairly long birth interval, up to about three years, in some areas, and every effort should be made to maintain this. In practice if a mother has a three-year birth interval, she is unlikely to have more than five or six children, but in an area where a short birth interval is common many mothers have 12 children.

Using the Chart to Encourage Child Spacing

For the use of the chart in spacing the children some information from the community is essential, and this is the breakdown of birth in percentiles. How this information is used is illustrated in fig. 18 which represents a country with a long birth interval. Table 5 shows the percentiles for countries with long and short birth intervals.

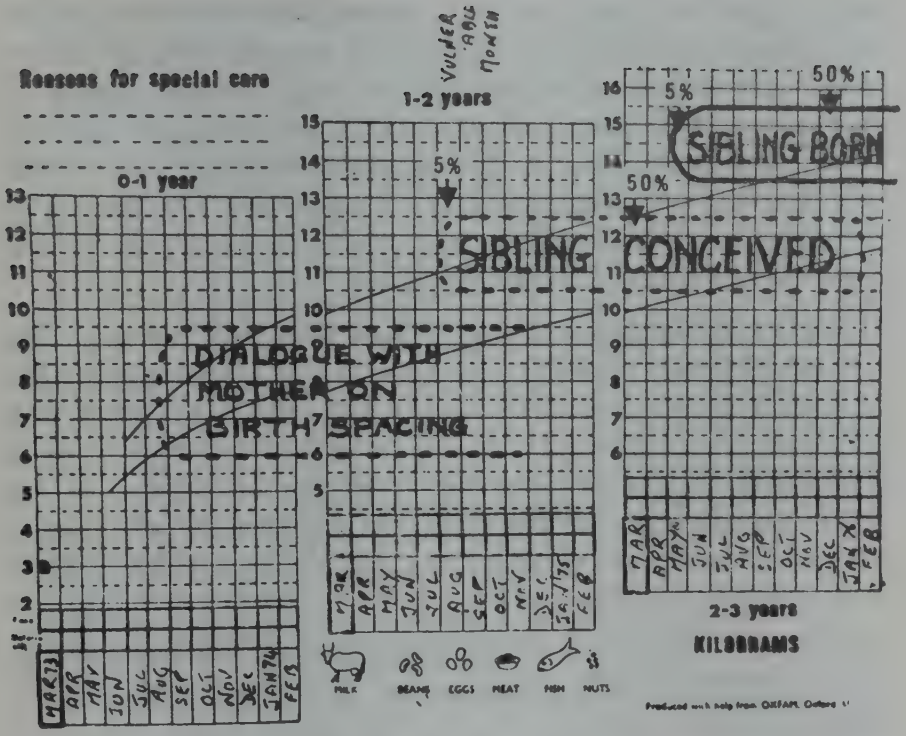


FIG. 18: Birth interval and when to begin family planning dialogue: the weight chart of a boy born in March 1973. In this community he has a 50 per cent chance of a baby brother or sister by December 1975 and a five per cent chance by May 1975. Taking nine months off this, we come to August 1974 when the risk of conception has reached five per cent. This can be called the "danger month" by which time the mother should have considered and undertaken contraceptive measures. For each community the range of birth interval needs to be calculated if this method is to be used.

Table 5

Duration in months of birth interval expressed as percentiles

	Number	5%	10%	25%	50%	75%	90%	95%
								month
Sample of West African mothers	588	27	29	31	34	38	45	50
Sample of Brazilian mothers	247	12	12	13	16	23	36	51

On the right hand side, you will see the fiftieth and fifth percentiles marked. At the month of the 50th percentile we can expect 50 per cent of the mothers to have produced another sibling. If we substract nine months from the fifth percentile, we find the "vulnerable month," which for this child is when it is 18 months old. In this month we can expect five per cent of mothers to conceive and by this time we should have persuaded the parents to use some method of family planning.

Fig. 18 indicates how a card is used with this method. The question of family planning was discussed with the mother when her baby was three months old. At that time, she agreed that she would like to have a three-year birth interval, but she was unwilling to do anything about it as her husband was still not demanding intercourse. However, later on, she and her husband agreed to taking some measure and she had an Intra Uterine Device (I.U.D.) inserted.

As her child grew well, she decided, when he was two and one half, to have the I.U.D. removed so that she could conceive again.

Motivation through Under-fives' Clinics

At the present time many family planning workers are approaching parents about family planning not knowing if a mother wishes to, or is likely to conceive or not. The chart contains information about the family and makes the maximum advice available on family planning at a time just before the mother is likely to conceive (fig. 19).

However, the greatest advantage of these clinics is in the field of motivation. While the usual procedure is for the worker to approach a mother about family planning, in the under-fiives' clinics, the approach is reversed, the mother comes to the health worker for help concerning the health of her child. Just as we believe that immunization is important for the health of her child, so now there is good evidence that postponing another conception is likely to lead to a healthier and stronger family. In this way, the mother is making the first approach and the advice on family planning is given to help her with her child, and not, at the time, with the primary desire to limit the size of her family.

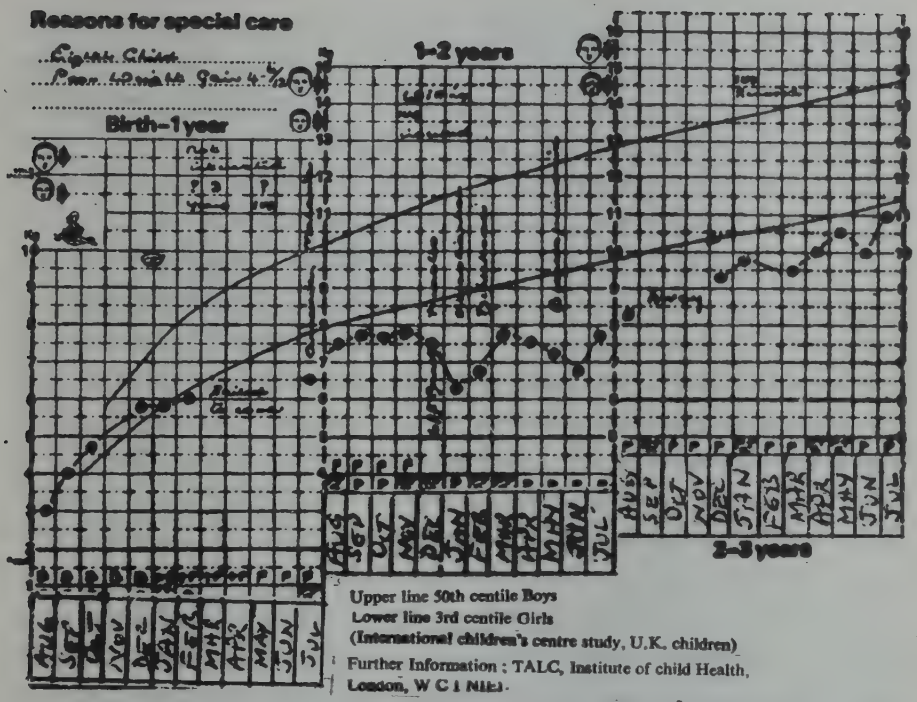

Reasons for special care
Birth–1 year
1–2 years
2–3 years
Upper line 50th centile Boys
Lower line 3rd centile Girls
(International children's centre study, U.K. children)
Further Information : TALC, Institute of child Health,
London, W C 1 N1EJ.

FIG. 19 : An example of a chart used to encourage child spacing. The under-fives' clinic growth chart which is kept by the mother in the home. In use emphasis is placed on the direction of movement of the child's own weight curve, and that the curve keeps parallel with the lines on the chart. This chart also incorporates information on whether the child is "At Risk" and the parents' attitude and acceptance of child spacing through family planning.

Advice about family planning follows so naturally from a concern for the children, and is more likely to be accepted. It is frequently possible to tell a mother: "Your child is doing very well. It would be a pity if you were to become pregnant too soon and deprive him of the good start which your care and attention have given him. You should use some form of family planning for at least a year or two more." It is more often necessary to tell a mother: "Your child is not doing well at all. It would be a real risk to his health if you were to become pregnant again soon. You should take some precautions to see that you do not conceive another child until this one is healthy and active."

Child Care, Family Size and National Planning

There is evidence from many countries that the size of the family depends on the survival of the children. It has been shown

in a number of countries that when the infant mortality falls, the birth rate falls soon after. In some countries, this has been associated with a rise in economic factors, but the improvement in economic conditions may not be essential. It is fairly certain that a reduction in child mortality will be followed, usually after a lag phase, by a precipitous fall in the birth rate.

The proposal in the fifth Five Year Plan to spend a higher proportion of India's national income on the small children under five is, therefore, likely to be a major step forward in reducing child mortality, as long as the planners can ensure that this money is spent on effective child care in the villages. It is suggested that setting up comprehensive child care services in the existing health structures, using the principles of the under-fives' clinics, may be the most effective way of reaching the needy children in this vital and vulnerable age group.

In the village in Africa where these clinics originated, the desire for smaller families has developed in about ten years. Similarly, in a number of centres in India where this form of clinic has been instituted, the acceptance of family limitation has been facilitated, and in one area the birth rate has fallen significantly. These early results suggest that if such clinics were widely adopted, they could be a most effective step in India's family planning programme.

IX Community Involvement, Evaluation and Research

Community Involvement

All that has been written in this book cannot come about unless everyone concerned is convinced of the need for community involvement. It is women within the community who can best be trained and sent to work as full-time, part-time, or even voluntary workers within their own community, and thus raise the standard of health care. The last decade in China has seen the revolutionary involvement of the so-called "barefoot doctor." These young men and women have been selected out of their community by the community. Having received as much education as is locally available, they have then spent a period of one to two years in training. This training has not been solely in scientific medicine, but also in local medical systems, the equivalent of Ayurvedic and Unani systems in India. On return to their community. they are still working in whatever employment they had before, but at the same time they offer simple but effective care to the community. They not only grow local herbs which can be used in herbal preparations, but at the same time stock antibiotics and other essential medications from the scientific system of medical care. They are also under the guidance and responsibility of the fully trained doctors of the district.

What health care in the Indian village has been provided has been brought in from outside; the services of few local personnel have been used and the village people have hardly

been involved in the decision making. Only when the process is reversed and the local community and its leaders take an active part, will health care advance at the speed it has done in some countries.

Community involvement demands that before any step is taken, the community must be consulted, their opinion should be considered, and they should be involved in every decision that is taken. There will never be sufficient resources from central funds in any country to provide elaborate health care for all. However, if the local community provides resources they will be concerned that these are well used and a major part should be for the health care of children.

Unfortunately, the care of children under five is generally not a high priority in the minds of the local communities at village level. However, if low cost, simple and effective under-fives' clinics can be set up in every block, either at a primary health centre or independent of it, and if these clinics are successful, it is probable that within a year or two other communities will want similar help A high proportion of the workers in the under-fives' clinics should be recruited locally Preferably, they should be married women put forward by a local community committee. It should not be difficult to develop a corps, of appropriately trained women from the village itself. Not only should these women be responsible for running the clinic; ideally, they will also set up an action group concerned about the total care of children in that village.

In order to take effective action in raising the levels of nutrition, immunization, and many other aspects of health and life in the village, information about the village and its people will need to be collected. The health action committee may be able to obtain such data by simple methods and using relatively unskilled workers. For example senior classes of the local school under the direction of the senior teachers could visit homes to examine the "Road to Health" charts of the young children and record how complete immunizations have been. Naturally, this will have much more far-reaching consequences than simply collecting data.

The involvement envisaged is such a radical change from the passive attitude prevalent in many villages that all the best

resources available will need to be stimulated. Local leadership must be inspired, and initially it may be up to the medical and and nursing professions, who have seen the vision of better things for the children, to provide inspiration and direction. Not all villages or communities are fortunate enough to have citizens with a civic sense of responsibility. In any area it will be important to use any lively and well organized group as the basis for better health care. Fortunately, providing good services and care for young children is an appeal that will move all but the most selfish and introduced.

Evaluation

In developing under-fives' clinics clear objectives should be set and these must be measurable.

Evaluation of the work of an under-fives' clinic may need to be considered on several levels; the activities of the clinics itself, the health status of the children attending, and the impact on the community as a whole. The topic deserves more careful study, but much valuable information can be gained by recording a few simple parameters from the children who attend each day. This can probably be done most easily using simple tally sheets as shown in fig. 15 in Chapter VII.

1. *A record of first and subsequent attendances each day.*
2. *A record of nutritional state.*

The totals can be further broken down by age and weight. The simplest nutritional assessment is to record those who lie either above or below the lower line on the "Road to Health" chart. This ratio will give some indication of the nutritional status of the children attending the clinic in that area. More important seasonal and yearly changes in this proportion will show whether the overall nutrition of the children in that area is improving. This simple figure has proved far easier to keep and more reliable than having a more complex breakdown such as that used in the Gomez system of South America, but some people believe that the lower "Road to Health" line is too high to give an indication about the amount of significantly serious malnutrition in an an area. Professor P. M. Shah's modification suggested in Chapter V is an alternative for those who find additional Gomez-type lines confusing.

3. *Records of infectious diseases which present at the clinic.* This will give some estimate of the effectiveness of the immunization programme, but because some infections rarely present at the clinic (e.g. measles in India), and others (e.g. T.B.) cannot be easily diagnosed at a single attendance, this sort of record may be of limited value.

4. *Record of "protected" children.*
These are children who have received a full primary course of all the vaccines made available through local resources. This is a more useful figure than the total number of any vaccine given as it indicates how effective the clinic has been is making sufficient contact with the children to get them to receive the full number of immunizations.

It is suggested that the records coming from the clinic should be limited to these, and great emphasis should be placed on their accuracy. In addition to this, as mentioned in the chapter on Community Development, each village should undertake its own study of the immunization level of its children at yearly or twice-yearly intervals.

Research

The under-fives' clinic stands at the interface between the social and medical problem which oppose the health of young children in India. There are still many unanswered questions about how to achieve the maximum effectiveness with this technique in the Indian setting and with the basic health resources available. The country has the technical know-how to plan and execute accurate research. It is hoped that the best brains can be turned to these fundamental question, since comprehensive child care is so closely linked with India's future.

X Instructions for the Consultation and Standing Orders for Treatment

Instructions for Nurses about the Consultations

1. *Health promotion is our aim*

Promotion means to encourage and advance in every way possible. We do this by:

a. Treating disease.
b. Teaching about feeding and nutrition.
c. Immunizing to prevent disease.
d. Encouraging family planning.

Teaching is involved in each of these. Many parents come to us with their sick children. They want help, so they come prepared to act on our advice. The child's illness is our chance to teach. As we help to treat the children, we can teach the parents. This is what is meant by health promotion. This is very important and responsible work, and we may save the lives of many children.

2. *The interview with the patient and relatives*

Good communication is essential if we are to understand the problems and help the family. A welcoming smile is the right way to start. Listen carefully and patiently to what the mother has to tell you, remember that she is very worried about her child, she may have had little sleep the night before, and possibly has travelled a long way for your help.

2.1. The complaints

a. Main complaint: ask what the main complaint is, and how long it has been present.
b. Other complaints: ask about any other complaints and how long they have been present.
c. Management: ask what the family has done to treat the condition so far.
d. Previous illness: ask about any serious illness or injury in the past.

2.2. Other important questions about bodily functions

a. Feeding: Always ask what the child is taking, how much is he taking, and how often. If a child is feeding eagerly and regularly, it is unlikely that he is very ill.
b. Leading questions: if the parents are a little uncertain about the main complaints, it is worth asking about:
   i. Bowel action—regularity, frequency, nature of stools.
   ii. Vomiting—frequency, quantity, associated complaints.
   iii. Cough—severity, duration, sputum, associated features.
   iv. Fever—severity, recurrence, duration, associated features, e.g. chills.
   v. Sleep—regularity and duration. A baby who cries a lot at night may not be getting enough milk.
   vi. Activity—does the child sit, walk, talk and play like other children of his age? Has there been any recent change in activity?

2.3. Look at the patient

Parents should be taught to undress the child before he is seen. Look carefully and note:

a. State of nutrition (weight card is an important guide in this, see below).
b. Activity, state of consciousness and nature of cry.
c. Respiration. Is this excessively rapid, or is there any indrawing of the ribs and intercostal spaces?
d. Abdomen. Are there any scars or abnormal distension?
e. Skin and scalp. Is there any sign of pustules, lice or other lesions?
f. Mucous membranes of tongue and eyelids. Is there excessive pallor from anaemia, or blueness from cyanosis?

g. Mouth and throat. Look carefully with a good light for redness from inflammation, pus or grey membrane on the tonsils, ulcers, or white specks of fungus.

2.4. Feel the patient

Gently touch the child and feel:

a. Pulse. Many people believe that the pulse is very important, so if you feel it they are likely to have more confidence in your advice. It also gives the chance to see if the heart is beating regularly, rapidly and forcefully, and you can judge the temperature of the limbs too. While holding the wrist you may continue to take the patient's history or examine his card.

b. Temperature. With some practice you will be able to judge if the body or limbs are abnormally hot or cold. (When in doubt, use a clinical thermometer.)

c. Lymph nodes. These firm lumps especially in the neck, the axillae and the groins are usual indications of infection in the area, and generally require referral to the doctor.

d. Oedema. If you think there is abnormal swelling, press firmly over the foot or lower leg for five seconds. A depression indicates oedema, and in many areas the commonest cause is Kwashiorkor.

2.5. Examine the weight card carefully (See Chapter V)

Note especially :

a. Present weight of the child, in comparison with
   i. Previous weights. This is most important, but also compare with the
   ii. "Road to Health" lines which show "normal" growth curves. This is the best way of diagnosing malnutrition If the child is gaining weight regularly and his curve is parallel to the "Road to Health" he is probably doing all right. If the child is not gaining regularly, his nutrition is not satisfactory.

b. Indications for specialicare. These may have to be filled in when you have considered the history and weight of child.

c. Previous illnesses. These should be written on the card. This will help you to understand and manage the present condition and will provide a good record of the medical history.

d. Family planning. Look at the family information panel, note the number of children and their years of birth. If there is information about the parents' attitude and action with regard to family planning, this can be followed up with relevant advice and help, and a comment entered in the appropriate place.

e. Immunization. Has the child completed the necessary immunizations, and, if not, are there any that could be given today? (See Chapter VII.)

f. Vitamin A concentrate. If this has not been given within the last six months, arrange for the the dose and write "A" at the bottom of the column of the current month.

3. *Action*

By the time you have done these things, you will have a good idea about the patient and you can proceed to:

3.1. Write a brief note on the child's weight chart and on any other clinic card.

3.2. Advise the parents. Always try and start with a compliment to the parents on some aspect of the child's appearance or progress, then they will be in a mood to listen to what you have to tell them.

3.3. Explain carefully about suitable management of the present condition, how to use the medicines given, correct feeding, when they should return to the clinic, and, if necessary, about immunization and family planning.

NOTE: six questions when looking after the under-fives is a summary of the nurse's duties during the interview, and is set out at the end of this chapter.

A friendly smile and joke will often help people to remember what we are trying to teach them. Loud scolding or sullen silence are useless when communicating the message of health.

Speed satisfies those who come, so try and cut down waiting times without cutting down essential teaching.

3.4. Prescribe and, if possible, provide any medicine or immunization that is needed..

3.5. Refer and accompany the child to the doctor if the condition requires this, explain what you have found out, why you are concerned about the child, and listen to the doctor's opinion and advice. This is an opportunity for you to learn.

The Cost and Benefit of Medication

As the under-fives' clinic is primarily "preventive" in its outlook, a large proportion of the money spent on drugs should be spent on vaccines for immunization. In the majority of cultures, including those considered to be technologically advanced, the bottle of coloured and strongly smelling medicine has a greater appeal than the tablet. While the injection may be impressive at the time, it cannot be carried home like a bottle of medicine and passed around for the relatives to examine. By providing such placebos for the rural mothers we are not "teaching them to rely on the bottle of medicine." In their own culture they certainly use herbal mixtures just as we may use unnecessary vitamins, and we will be substituting something that we know is harmless, for something that is unlikely to be beneficial and may be harmful (as has been shown in the case of the Jamaican herb teas which led to cirrhosis).

Such "Welfare Mixtures" are a physical support for the good advice with which they are prescribed. Mothers frequently want to know with what the medicines should be given, and this is a chance for recommending dietary supplementation; "give it twice a day with a cupful of milk" or whatever instructions are appropriate to the child's physical condition and the parent's economic state. When the mother returns home bearing a bottle of "tonic," her time at the clinic will appear justified to her relatives, who may have had to undertake some household chores for her, and perhaps have supplied the money to make her visit possible. Thus, the "Welfare Mixture" that costs only a few paise per litre will have served several important functions.

Of liquid medicines given, the electrolyte repair mixtures (El. Mx. and El. Home-mix) for diarrhoea may be the most

valuable. These contain sodium chloride with sugar, and preferably also potassium bicarbonate. More important than the precise composition are the instructions that the mother should devote plenty of time and effort to ensure that her child drinks a really liberal amount of this dilute "medicine" when he has profuse diarrhoea. The iron mixture (Fe. Mx.) has significant pharmacological as well as psychological benefits and can be prescribed liberally.

Tablets are best pre-packed, as this reduce the problems of checking and their distribution. Directions for their use may be stamped on the pack with a rubber stamp, or a small duplicated slip included, if they are packed in polythene.

Injections are expensive in terms of nurse's time, equipment and sterilization. They also tend to make children frightened of clinics. However, they have a high status image in India, and eliminate the possibility of the medication being forgotten at home. These considerations need to be weighed carefully when preparing the standing orders for any particular area.

A most important economy is for the common and simple medicines to be given out by the nurse herself. This saves particularly the mother's time, as she does not have to queue at a pharmacy to receive her medicines. In this, as in other activties the senior staff will continually observe and discuss with other personnel what innovations or changes may lead to greater efficiency. For example, in dispensing liquid medicines a wide-mouthed container into which a scoop will pass allows the nurse to measure out and dispense, through a funnel, into the mother's own bottles a known amount of medicine. When instructing the mother about the quantity to give the child, locally available demonstration spoons are required. Holes are drilled in the handles of the different sized spoons. Three spoons attached together with a key ring are less likely to disappear than one unattached spoon (fig. 3, Chapter III).

Standing Orders for the "Top Ten" Diseases of Children in India

These instructions are only guidelines and will have to be modified in different areas and situations. However, they are the

product of practical experience and have proved satisfactory in South India.

Note especially the **Danger Signs** which mean that you **must refer the patient to the doctor.**

The names of the medicines are abbreviated in this section. They are given in full in the next section under the heading of Medicines and their Dosages.

1. *Protein-Calorie Malnutrition (PCM)*

Types of PCM

a. Kwashiorkor—PCM with oedema. Predominant protein deficiency. Less common, but more dramatic and obvious.

b. Marasmus—PCM with gross wasting. Predominant calorie deficiency. Common but less obvious.

c Marasmic-Kwashiorkor—the combined form of PCM that is not uncommon. The oedematous phase is often precipitated by an infection in a marasmic child.
Mild degrees of PCM are very common, accompany many other conditions and will be missed unless the weight card is used to help diagnose them.

Management of PCM

a. Feeding advice is essential, and demonstrations are valuable. See the instructions in Chapter VI.

b. Regular weighing and charting on the weight cards is invaluable as it clearly shows the progress and helps to give the parents the aim of promoting adequate growth.

c. Treatment of associated disorders.
Aanemia is very common in PCM. Look for pale mucous membranes.

Rx. Tabs. or Mist. Fe. and
Tabs. MVT

Xerophthalmia, vitamin A deficiency is common in PCM. See No. 8 below.

Diarrhoea. See No. 5 below.

Infections, e.g. pneumonia, skin sepsis, etc., are commonly associated with PCM and should be treated specifically. Parasites in the intestines are quite common in PCM.

Rx. Tabs. Pi. for thread worms and round worms.

Danger signs in PCM, indications for referral or admission:

Oedema.
Diarrhoea, recurrent.
Fever, presistent.
Failure to gain for several months or loss of weight.

2. *Cold and/or cough* of less than a week's duration and without fever, i.e. upper respiratory tract infection (URTI)

Rx. Tab. As.
Mist Co.
| Prescribe for two or five days.

3. *Cough with fever* or cough of over a week's duration, or with much sputum, i.e. lower respiratory tract infection (LRTI)

Rx. Inj. PPF. and/or
Tab. SD.
Tab. As. Prescribe for at least five days.
Mist. Co.

Danger Signs :

Distressed or difficult respiration.
Noisy breathing with any signs of obstruction, i.e. drawing in of inter-costal or supra-sternal spaces and movement of alae nasi.

Persistent cough for more than two weeks is reason to refer for Mantoux test, or differential white cell count, in case of T.B. or eosinophilia.

4. *Sore throat*, inflamed throat, and tonsils, difficult swallowing, and enlarged or tender glands at the angle of the jaw.

Rx. Inj. PPF. for five days,
Tab. As.
Gargle with saline.

5. *Diarrhoea and vomiting* associated with *diarrhoea.*

Rx. Tab. SD.
Inj. CLP if vomiting very bad.
NaKS or El. Home-mix, electrolyte repair solutions.

Danger Signs:

Much vomiting.
Signs of dehydration (sunken eyes, depressed fontanelle, drowsiness, poor volume or rapid pulse, decreased urine, and poor skin elasticity).
Rapid respiration (from acidosis).
Dysentery (pus or blood in the stools).
Refer immediately for any of these things.

6. *Skin infection*

a. Mild and dry
Rx. Tab. MVT
Appl. GVS or ZO

Note: Importance of regular washing, especially with a "medicated" soap.

b. Scabies
Rx. Appl. BB

c. Moderate with some pus
Rx. Inj. PPF
Tab. MVT
Appl. MS dressing or GVS

Correct instructions for application of BB in Scabies; total body application after bathing whole family, clean clothes etc.

Danger Signs:
Severe and extensive disease.
Abscesses.
Tender and enlarged lymph nodes.

7. *Purulent Discharge from the Ear*
Chronic suppurative otitis media (CSOM).
Though common, this can be dangerous, producing meningitis and brain abscess. It is a cause of deafness.

Rx. Inj. PPF.
Tab. SD.
Appl. TO or GC and Ep.

Note: It is important to clean the ear, wiping out the pus before inserting drops. Long term treatment with antibiotics and physical removal of debris from the ear may be necessary. Chronic cases probably need some surgery of the ear, and possibly adenoidectomy.

Danger Signs:

Tender mastoid process.
Headache and drowsiness.

8. *Sore Eyes*

a. Inflammation, i.e. conjunctivitis.

Rx. Wash eyes regularly with sterile saline.
Appl. CAF. oint. every 4 hours, or as often as possible.
Tabs. SD, if very severe.

b. Xerophthalmia, i.e. dry discoloured sclera, photophobia, night blindness, Bitot's spots.

Rx. Vit. A. concentrate 200,000 IU in 2 ml orally. MVT, if mild.
Advise about the use of leafy and coloured vegetables and fruit.
There may also be signs of inflammation, so CAF oint. may also be needed.

Danger Signs:

If you cannot open the eye and see the cornea, or if there is corneal opacity or ulcer.
Refer immediately for Aqueous Vitamin A injection. Hours matter in Xerophthalmia, and delay may result in blindness.

c. Corneal Foreign Body or Abrasion

Rx. Wash eye with sterile saline.
CAF oint.

Danger Signs:

If there is corneal perforation, refer immediately.

9. *Fever*

a. Fever slight, less than 3 days duration, and without any leading symptoms.

Rx. Tab As.
Mist. Wf.
Advise about giving plenty of fluids.

b. Fever high, with complicating factors, and a failure of response to simple treatment.

Rx. Inj. PPF. and/or
Tab. SD.
Tab. As.
Tepid sponging, and
Generous fluid intake to keep up the urine volume.

Note: Ask about and look for causes of fever and and treat accordingly, e.g. ear discharge. All those with high fever should have blood smears for malaria under the malaria eradication programme.

Danger Signs: Convulsions or drowsiness.
Persistent fever with cough, which may be T.B.
Refer all such patients urgently.

10. *Head Lice*, i.e. Pediculosis capitis.

Rx. DDT powder, to be mixed with coconut or other oil.
Apply before bed time, and cover head. Wash and comb the next day, and repeat in a week.

It may be necessary to treat the whole family.

Other Important Points

Newborn babies who go off feeding, and have depressed response and reflexes, look pale or grey may be very ill with septicaemia and meningitis without much fever. Give PPF and SM injections. Refer immediately and advise admission.

All children with unexplained fever, glands, chronic cough, and those who are not gaining as well as expected, should have a Mantoux test. This helps to diagnose T.B. Enquire about contacts and screen family members.

Refer to the doctor children who have congenital abnormalities. those who are not developing as fast as expected, those with conditions with which you are not familiar, and, of course, all who are seriously ill. Any parent who wishes to see the doctor may do so, but explain that he or she will probably have to wait for some time.

Vitamins and iron can almost always be prescribed with benefit, but it is much more important to explain to the parents about giving correct food that contains these nutrients. (See the feeding instructions in Chapter VI).

Above all remember that prescribing may be easy, but presuading parents to give a better diet and better health care is more difficult, but is more worthwhile in the long run. This teaching is your main job.

Medicines and Their Dosages

Medicines which may be stocked for an Under-fives' clinic.

1: *Tablets*

As i.e. Aspirin, 325 mg
Fe i.e. Ferrous sulphate, 300 mg
IN i.e. Isoniazid, 100 mg
Pi i.e. Piperazine, 500 mg
SD i.e. Sulphadimidine, 500 mg
MVT i.e. Multivitamins

2. *Mixtures*

Co Mx. i.e. Cough mixture, a cheap mixture flavoured with Tincture of Camphor so as to smell like a "cough mixture."

El Mx. "NaKS"

Sodium chloride	0.85 gm
Potassium bicarbonate	1.00 gm
Sucrose	25.00 gm
Water	550 ml

"El Home-mix"

Salt	½ teaspoonful
Sugar	4 teaspoonfuls
Boiled water	500 ml

Fe Mx.

Ferrous sulphate syrup	200 mg in 4 ml

This must be well diluted before being given.

Wf. Mx. i.e. Welfare Mixture as described in "Medical Care in Developing Countries," section 16:8.
Peppermint water few ml
Cochineal colouring few drops
Sugar to taste
Water as required

Note: Co and Wf Mixtures are basically placebos, something physical to support the good advice with which they are prescribed.

3. *Injections*

PPF i.e. Procaine Penicillin Fortified, e.g. "Seclopen" Glaxo.
Procaine penicillin 300,000 units
Crystalline penicillin 100,000 units

SM i.e. Streptomycin sulphate
1 gm is often made up to 2.5 ml and then conveniently prescribed in fifths for small children, 200 mg in 0.5 ml

CLP i.e. Chlorpromazine, e.g. "Largactil" (M & B) or an analogue

4. *Immunologicals*

DPT/Vac Triple vaccine
Tet/Vac/PTAP Tetanus purified toxoid, alum precipitated
Salmonella Typhae/Vac Typhoid vaccine acetone dried
Freeze-dried BCG vaccine
OPV: Oral polio vaccine

Note: Vaccines need to be preserved carefully. Some are very thermolabile (i.e. sensitive to temperature changes) e.g. OPV, and others are photo-sensitive (i.e. damaged by sunlight) e.g. BCG.

5. *Applications*

BB Benzyl benzoate solution, for use in scabies.

CAF Chloramphenicol eye ointment for conjunctivitis and trachoma. Use at least four times daily if condition is severe.

DDT Insecticide for the treatment of pediculosis.

Ep Ephedrine nasal drops for chilrden with CSOM and for infants with colds blocking their noses.

GC Glycerin and carbol drops for use in CSOM if cannot afford TO.

GVA Gentian violet aqueous solution for application to sore mouth, especially for thrush, moniliasis.

GVS Gentian violet in spirit, bactericidal for skin sepsis.

H_2O_2 Hydrogen peroxide for cleaning out dirty wounds and ears.

Io Iodine for sterilizing skin.

M and E Menthol and eucalyptus ointment for use in colds and in general aches and pains (Vicks Vaporub, an alternative).

MS Magnesium sulphate solution for dressing abscesses, etc.

NaCl Common salt, for use in making home saline mixture for bathing sticky eyes, and diluting and giving by mouth in diarrhoea.

TO "Terramycin Otic Drops" (Pfizer), the best antibiotic combination for use in CSOM. Use four times daily after cleaning the ear carefully.

ZO Zinc oxide and castor oil ointment for dry and itchy skin conditions.

Note : Supplies of Iron with Folic Acid tablets and vitamin A concentrate should be available through the local District Medical and Health Officer. These should also be stocked.

Dosages to be Used

In calculating the dosages it has been approximated that :

Infants under one year may weigh about	6 kg
Children one to five years may weigh about	12 kg
Children over five years may weigh about	20 kg
Adults may weigh about	50 kg

Obviously young infants will not weigh 6 kg, and some adults will weigh 70 kg. So some adjustments may be made .

A method of using a weight chart as a ready reckoner to calculate the dosage of common drugs has been described in Chapter V.

Tab. As. (Aspirin)

It is given in the dose of 65 mg/kg/24 hours. The drug is to be given in 3-4 divided doses. The approximate requirement will be

1 year	¼ tab. tds.
1 to 5 years	½ tab. tds.
Over 5 years	1 tab. tds. after food

Tab. Fe. (Ferrous sulphate)

Upto 5 years	Fe Mx. 2 ml (100 mg) BD
Over 5 years	1 tab. BD after food
Adult	1 tab. tds. after food

Tab. Pi (Piperazine)

Upto 3 years	2 tab.	as a single dose in the evening given for 2 days
3 to 7 years	4 tab.	
8 to 14 years	6 tab.	
Adult	7 tab.	

Tab. SD. (Sulphadimidine)

1 year	¼ tab. QID	drink plenty of water when using these tablets
1 to 5 years	1 tab. tds.	
Over 5 years	1½ tab. QID	
Adult	2 tab. QID	

Tab. MVT. (Multivitamin)

All ages	For prevention or mild deficiency, 1 tab. daily. For obvious deficiency, 1 or more tab. tds.

Tab. IN. (Isoniazid)

According to instructions of a doctor, and usually in combination with some other anti-tuberculous drugs.

Co. Mx. (Cough Mixture)

All children	4 ml i.e. a teaspoonful QID
Adults	8 ml i.e. 2 teaspoonsful QID

Wf. Mx. (Welfare Mixture)

All children	4 ml i e. a teaspoonful QID

PPF Inj. (Procaine penicillin fortified)

Under 5 years	0.5 ml i.e. 200,000 IM.	Once daily for 5 days.
5 to 10 years	1 ml i.e. 400,000 IM.	
Adults	1·5 or 2 ml i.e. 600,000 or 800,000 IM.	

SM Inj. (Streptomycin sulphate)

Under 1 year	0.2 ml i.e. 1/5 mg IM	In tuberculosis once a day is sufficient, and an equivalent lower dose in children.
1 to 5 years	1 ml i.e. 2/5 mg IM.	
Over 5 years	2 ml i.e. 4.5 mg IM.	
Adult	2.5 ml i.e. 1 mg IM.	

The doses are stated in fifths so that when 1 gm SM is mixed in 2.5 ml, 0.5 ml contains 1/5 i.e. 200 mg in 1/2 ml.

Instructions when prescribing medicines

These should be :

1. *Simple* : The fewer medicines prescribed, the better. Preferably they should all be taken the same number of times each day. Many will forget the instructions unless they are very simple.

2. *Clear* : The patients and relatives must understand how the medicines are to be used or they will be wasted. Talk in terms which they can understand, and show them a spoon, glass or feeding cup when talking about different volumes.

Note : Ask the parents to repeat the instructions back to you; there will be a better chance that they will remember the details.

Once again remember that "teaching" and not "prescribing" is our main responsibility. With experience it will be easy to prescribe the correct treatment for a disorder. It will never be so easy, but it will always be more worthwhile to convince a family to adopt some healthier ways and eat a more nutritious diet.

3. *Confident* : Belief in a medicine is very important. The patients' and the relatives' faith in the treatment greatly depends upon the confidence with which you prescribe.

Six questions when looking after the Under-fives

1. Why have the parents brought the child ?
   Unless you show that you understand their concern and intend to deal with it, parents are unlikely to listen to your advice. Satisfy the "felt need" first.

2. How is the child growing and developing ?
   The weight chart is the best guide to growth, and deve-

lopment can be assessed from observation and a few specific questions.

3. What feeding does the child receive ?
   This question follows naturally from the previous one and is the introduction to feeding advice (Chapter VI).

4. Is any immunization necessary today ?
   This can be decided by noting the child's age and looking at the immunization panel on the weight card. (Chapter VII).

5. Should vitamin A concentrate be given this month ?
   Look when the last "A" was recorded on the weight card. If it was six or more months ago, arrange for the supplementation.

6. Do the parents need any advice about family planning ?
   Examine the family information panel and the family planning sections on the weight card. See how old the child is and note the previous birth intervals. In the context of concern for the health of the child, many parents are receptive to help about spacing and limiting the number of their children.

Note : it may not be necessary to take up every point each time a child is seen. but the nurse should always keep the six questions in her mind.

Teaching is involved in each point.
It may be useful to print these questions on a card which can be kept on the table of each nurse in an under-fives' clinic.

XI Child Health Care in the Sub-centres

The child health clinics described in the previous pages will improve the health of children attending hospitals and health centres. However, in rural areas people rarely travel 3 to 6 kilometres for medical care,[28] and most mothers do not seek immunization and early treatment of disease.

A research team* investigating child morbidity and mortality in rural areas concluded that health improvement required a combination of services (fig. 20).

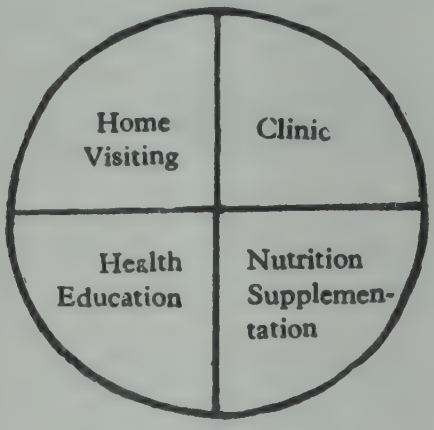


FIG. 20: Health Services for Children

*Rural Health Research Centre, Narangwal, Ludhiana District, Punjab

The health services shown in the diagram include: 1. clinics, 2. health education about the effectiveness of treatment for apparently lethal children's diseases like pneumonia, 3. regular home visiting to detect and follow-up the "high risk" child, and 4. nutrition supplementation programmes for young children.

In an area where marasmus is the major problem, it is well known that a high percentage of all deaths between birth and five years occurs in the first 30 months, and consequently programmes should concentrate on this age-group.

The primary health centres established in the country try to reach the vast rural population, and each primary health centre serves a population of about 100,000. A very small number of pre-school children, perhaps 500, will be within 5 kilometres of most primary health centres. To fulfil the aims stated in the foreward and introductory remarks, it is essential that child care should reach further to the sub-centres and the surrounding villages.

The primary health centre doctors have the responsibility for all the children in the block. To discharge this heavy responsibility it is essential that they should share the work with the lady health visitors and ANMs.

For these nurses to be effective and to be able to share the responsibility, a system of delegation of duties should be devised and a certain quality of inter-personal relationship has to develop. The attitude of the doctor towards the ANM should always be to help her develop self-confidence, learn more about her work, and assume her share of responsibility. This attitude should pervade right through, but needs to be well defined in an organized training programme.

This chapter proposes modifications of the under-fives' clinics for the sub-centre level, based on the experience in one rural area of Punjab. It will not go into the other necessary aspects of any child health programme in the rural areas of India.

The ANM assigned to a sub-centre serves 3,000 to 5,000 population in her area. She daily sees patients, including children, at the sub-centres and dispenses a few medicines and family planning supplies. She is helped by a *dai* or attendant. A high standard of care in the daily clinics requires :

1. an adequate supply of medicine,
2. a weighing scale,
3. simplified recording,
4. medical back-up, and
5. supervision and continued training.

Some points have been dealt with in other chapters. However, the necessity for medicines for the ANM and health worker cannot be over-emphasized.

If vaccines were available at sub-centres immunization could be part of this clinic programme; unfortunately, they are often withheld because of lack of cold storage. DPT and Tetanus Toxoid may be stored without refrigeration at sub-centres for 7 to 10 days without any appreciable loss of potency of these products. It would be possible to plan immunization programmes in the winter months, especially in Northern India, when the weather is less likely to damage vaccines. To provide immunization at the sub-centres requires not only vaccines, but also personnel. It is difficult for an ANM to add immunization to the daily clinic routine, but this could be planned for a special clinic on the day when the lady health visitor attends, and she could bring fresh vaccines with her. A team comprising a lady health visitor, an ANM, and an attendant could run a clinic close to the model described in these pages.

Medical Back-up

This has been touched on in the chapter "The Team and its Tasks", but two aspects deserve further discussion : standing orders and referal system.

Standing Orders

Chapter X provides a sample of instructions for consultation and standing orders for treatment. These are written for fully qualified nurses in under-fives' clinics, where a doctor is readily available. ANMs in village sub-centres have lower general educational background, a shorter training in nursing, and the doctor may be 8 or 16 kilometers away. The instructions and standing orders require greater detail and simpler language.

ANMs have not learnt to take decisions, but as this is necessary for proper health care of children, they must be

helped to do so. The standing orders should anticipate the decision points, as far as possible, and provide guidelines on what to do at each point. They must cover most ailments and emergencies seen at sub-centre. Village mothers expect help from the ANM in emergencies, so they should be able to do something practical. The top ten diseases have to be emphasized, but not to the exclusion of other conditions. An ANM should know how to give first aid for burns, deep cuts, etc.

Relevant details have been given in *Child Health in Rural Areas**, and a large section in that book deals with a framework to help the ANM make decisions on treatment and referral to a doctor.

Referrals

Standing orders must be supplemented by the possibility of referral. It is essential that a doctor should visit a sub-centre regularly to see the patients the ANM cannot deal with or those she has doubts about. Referral clinics should be planned for a *fixed* time each week. It is difficult for mothers to leave their homes and work to come to the sub-centres. If a mother attends on the instructions of the ANM, waits a long time and the doctor does not arrive, this mother's faith in the service, and that of her neighbours who hear of it, will be shaken. Road conditions and other emergencies may intervene, but a schedule for referral should always receive the highest priority from everyone concerned. The way a referral is handled is described in Chapter IV. One point can be added. A doctor coming to a sub-centre should refuse to see a mother and child unless the ANM had seen them first. The reason for this is to build up the confidence of mothers in the ANM and prevent the referral clinic becoming a special doctor's clinic.

A system of referral should be worked out for each sub-centre. One method based on practical experience is described in *Child Health in Rural Areas*, and can be modified by the doctor, lady health visitor and ANM working together. Points to consider when deciding on referral from a sub-centre include :

*Asia Publishing House, Indra Palace, Connaught Place, New Delhi, available from VHAI (code, Ch—08)

1. distance of sub-centre from the primary health centre or hospital,
2. road conditions between the sub-centre and the primary health centre,
3. availability of any local means of transport for people in the village,
4. common diseases in the area,
5. seasonal diseases in the area,
6. experience of the ANM, and
7. availability of a person who is better trained than the ANM in the sub-centre.

Training

The importance of training personnel on the job has been emphasized in previous chapters, but in-service training alone is not enough if the health team is to function well. Clinics are busy, the basic training of an ANM is limited, and it is not always appropriate to discuss in front of patients all that the staff needs to know. It is, therefore, necessary to have carefully planned and regular formal training.

Training sessions of a half-day or a day every two weeks or each month have proved adequate. The objectives of such training are the following :

1. To instruct each member of the health team in the functions and activities of his or her respective job.
2. To promote a team approach to health care, by clarifying inter-relationships between different team members, patient referral system, delegation, communication, and supervision.
3. To feed back information from the field staff on the functioning of the service, the deficiencies, inconsistencies in standing orders, etc., so that effective corrections can be made.

The in-service training sessions can also be utilized for the following :

a. announcements and introductions of new policies and practices,
b. reinforcement of existing policies, and
c. for social gatherings.

Organization

The doctor and the public health nurse or senior lady health visitor are responsible for organizing the training sessions. The time available can conveniently be divided up and allotted so that each session includes the following:

1. a systematic presentation of one or more aspects of the service,
2. review of an area identified by the supervisions and doctor as needing special clarification or strengthening,
3. management of common accidents and seasonal diseases,
4. questions or observations on any aspect of the service, and
5. free time for discussion of a current problem.

The main responsibility for the different parts of the programme is with the doctor and the nurse. Occasional guest speakers from other health centres may be invited. A most useful activity is to assign presentation to the lady health visitors or ANMs It may take longer for the senior staff to help the auxiliaries with their preparation than to do it themselves, but it is worthwhile for the auxiliaries to take the responsibility. The practice promotes confidence in themselves and also understanding of the main objectives.

Teaching Methods

When reviewing pre-selected service activities, in addition to didactic lectures, discussions, case presentations, classroom tests, demonstrations, etc. should be used. It is essential that auxiliaries overcome their diffidence and participate in discussions. This requires considerable effort, but is necessary, or planning activities remain remote from practical field problems. Role play has a definite place in the training programme. The role that every member of the team plays should be discussed before acting it. Interview skills, consultation, examination of patients, group and individual health education are activities that can be very well learnt in this way. This will be really beneficial if the senior members of the staff actively participate in the discussion and role play along with the auxiliaries.

Case presentation is a very useful method to review the management of patients. The reconstruction of events leading to a death strongly reinforces the role of each member of the team in the treatment and care of patients with similar conditions. Other case presentations may be on patients referred to the primary health centre or district hospital.

Case presentation of deaths by an ANM should include :

1. review of presenting signs and symptoms,
2. when the signs and symptoms were recognized.
3. who recognized them,
4. what treatment was given and by whom,
5. when the referral to the primary health centre physician was made,
6. when the patient was seen by the doctor and what he did, and
7. how the ANM and family followed the treatment.

Special efforts should be made in each case to determine whether the death could have been avoided and how the health team could improve its services to prevent such deaths in the future.

Presentations by two or three ANMs of the stastistics of the work done in their sub-centres, highlights the differences between sub-centres, if any, and also between the workers. This helps to highlight any differences and consider improvements. It can also develop a healthy rivalry between the workers. The content of the review of work can include the number and kinds of referrals or emergencies seen in a set period, the total number of children with completed immunizations, the number with the first, second or third degree malnutrition, total deaths in the community according to age, and the number of families using family planning methods. To review the contents of the total service requires preparation and a supervisor may have to spend one or two days gathering facts but the time is well spent as it will improve the quality of service.

To improve the child care provided by about 33,000 ANMs now working in sub-centres throughout the country

will require a sustained effort on the part of senior members of the health team. However, the needs of the millions of children in rural areas can only be met by improvements in the health care provided by sub-centres.

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Appendix

Immunization Schedule

Right from birth children are exposed to many infecting agents. Fortunately, they can be protected against some of the diseases by immunization. An immunization schedule to protect them against some of these diseases is given below :

Prenatal	tetanus toxoid (injection) to the pregnant woman.
Child	
Age 3 to 8 months	Start with a. first dose of DPT (injection) first dose for polio (oral drops) BCG (injection) b. After an interval of 1-2 months give : second dose of DPT (injection) second dose of polio (oral drops) Smallpox (vaccination). c. After an interval of 1-2 months. give DPT (injection) & polio vaccine (oral drops).
9 to 12 months	Measles vaccine (injection one dose, where available.
18 to 24 months.	Booster DPT (injection) Booster polio vaccine (oral drops)

5 to 6 years	a. booster D.T. (Diptheria and tetanus injection). first dose of typhoid monovalent or bivalent vaccine (injection). b. After an interval of 1-2 months, give second dose of typhoid vaccine (injection).
10 years	Booster tetanus toxoid (injection). Booster typhoid monovalent or bivalent vaccine (injection) *or* First dose of typhoid monovalent or biovalent (injection), if not given earlier, followed by second dose of typhoid vaccine (injection), after an interval of 1-2 months.
16 years	Booster tetanus toxoid (injection) Booster typhoid monovalent or biovalent vaccine (injection). *or* First dose of typhoid monovalent or bivalent (injection) if not given earlier followed by second dose of typhoid vaccine (injection) after an interval of 1-2 months.

Note 1. *Pregnant woman :*

Since the history of a previous tetanus immunization is normally not available, it is preferable to give three doses of tetanus toxoid (tetanus vaccine), at monthly intervals starting as early in pregnancy as possible. This should be the aim. However, no pregnant woman should be denied even one dose of tetanus toxoid (tetanus vaccine) if she is seen late. This protects both the mother and new born against tetanus.

2. *Children*

   a. The ages shown for the various immunizations are considered the best times. However, if there is any delay in starting the first dose, the periods may be adjusted accordingly. It should be the aim that a child, before reaching one year of age, should have received DPT, BCG, smallpox and polio vaccine and, if available, measles vaccine.

   b. Where two or three vaccines shown together e.g. BCG + DPT + Polio, these vaccines can be given at the same time.

3. Different vaccines, unless received as a mixed vaccine **should not** be mixed together in the same syringe. It is preferable to give the different injectable vaccines at different sites.

Contra-indications and precautions

Malnutrition or illness is a contraindication for any immunization.

DPT/Vac

1. Fever
2. Previous severe reaction to DPT e.g. febrile convulsions, presistent crying, collapse (rare), or encephalitis (very rare).

Smallpox Vaccination

1. Marked malnutrition especially with skin lesions.
2. Any eczema, burns, or other severe skin disease.
3. Diseases affecting the immune mechanism, and leukaemia.

OPV

1. Diarrhoea (mild diarrhoea probably does not matter much).
2. Discourage breast feeding for 3 hours before and after. Other milk or fluids may be given.

BCG

1. Known Tuberculin positive

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